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ABSTRACT

The effects of Washington state education reforms on schools and classrooms were studied through surveys completed by about 150 elementary and middle school principals and about 400 writing and mathematics teachers in grades 4 and 7, the grades in which students take the Washington Assessment of Student Learning (WASL) tests. The surveys asked about the respondents' familiarity with the reform and their opinions about it. Principals were also asked about the implementation of the reform, including changes to standards, curriculum, and assessments. Teachers were asked about participation in professional development and changes in their classroom practices. Surveys showed districts and schools in transition, with change not always occurring uniformly. Principals and teachers had studied the reform, and believed they understood it. Teachers were changing classroom practices with the most visible changes being those related to the WASL results. Mathematics teachers and elementary school teachers had made more changes than writing teachers and middle school teachers. The surveys also show a mixed picture about the relationship between school practices and WASL scores. Four appendixes contain examples of essential academic learning requirements for writing and mathematics, survey items included in the regression analyses, and results of the regression analyses. (Contains 35 tables, 20 figures, and 29 references.) (SLD)

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The Effects of the Washington State Education Reform on Schools and Classrooms

CSE Technical Report 525

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August 2000

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Project 1.5 The Effects of Standards-Based Assessments on Schools and Classrooms
Brian Stecher, Project Director, CRESST/RAND

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THE EFFECTS OF THE WASHINGTON STATE EDUCATION REFORM ON SCHOOLS AND CLASSROOMS

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Summary

A growing number of states are implementing standards-based school accountability systems in efforts to improve student achievement. Washington state's Education Reform Act is an example of such a reform. It mandated the creation of academic standards, called the Essential Academic Learning Requirements (EALRs), a state assessment system, called the Washington Assessment of Student Learning (WASL), and an accountability mechanism, which is still under development. One feature that sets Washington apart from other states that implemented similar systems is that Washington policymakers have adopted a gradual approach to implementation, bringing new subjects into the assessment system on an incremental basis over the period of a decade.

Researchers from RAND and the University of Colorado at Boulder, are studying the implementation and impact of the Washington reform on school and classroom practices, focusing on the subjects of writing and mathematics. In 1998-99, surveys were sent to a representative sample of about 150 elementary and middle school principals and a representative sample of about 400 writing and mathematics teachers in fourth and seventh grades. These are the grades in which students take the WASL tests. The surveys asked about the respondents' familiarity with the reform and their opinions about it. Principals were also asked about implementation of the reform at the district and school levels, including changes to standards, curriculum and assessments. Teachers were also asked about their participation in professional development and changes in their classroom practices in writing and mathematics.

The surveys revealed a picture of districts and schools in transition, with many changes occurring but not always uniformly across classrooms or schools. Principals and teachers in Washington have spent a great deal of time learning about the reform, and they believed they understood its key components well. In general, they believed the standards were appropriate and attainable. At the district level, steps were being taken to align curriculum and assessment with the state system. Schools and teachers were also working to make their programs consistent with the direction set by the state. Teachers were changing classroom

curriculum and instruction in response to the reform. Not all aspects of the reform were equally salient, however. In general, classroom changes appeared to be consistent with the EALRs, although local educators appeared to be responding most to the highly visible WASL scores and making curriculum changes primarily in the WASL-tested subjects. Classroom-based assessment, in particular, was not as widely understood or endorsed as the EALRs and WASL.

There were also a few differences between groups of educators that are worthy of attention. Principals had a greater understanding of the reform than teachers, and they were more positive about its basic goals. Teachers' responses varied somewhat across subjects and grade levels; mathematics teachers made more changes to classroom practice than writing teachers, and elementary school teachers made greater changes than middle school teachers.

Finally, the survey responses paint a mixed picture about the relationship between school practices and WASL scores. On the one hand, after controlling for student background factors, WASL scores were higher in schools where teachers reported alignment between their curriculum and the EALRs and (to a lesser extent) where teachers reported that they understood the EALRs and WASL. On the other hand, some of the responses raised questions about the meaningfulness of WASL scores and score gains as indicators of attainment of the standards. Most teachers believed that test preparation was responsible for the majority of score gains. Many teachers thought that the WASL was not appropriate for the grade levels at which it was administered. These issues deserve further scrutiny as the accountability system is developed.

Background and Purpose

In 1995, researchers at RAND and the University of Colorado at Boulder (CU Boulder) began a program of research on the impact of standards-based, test-driven reforms on school and classroom practices. These studies, which were conducted under the auspices of the Center for Research on Evaluation, Standards, and Student Testing (CRESST), included both statewide surveys of principals and teachers and case studies of carefully selected, exemplary teachers. The research design called for conducting similar investigations sequentially in two states, one that was an "early implementer" of standards-based reform, and one that initiated such reforms at a later time. Kentucky was selected as the first state, and the RAND and CU Boulder teams conducted research there from 1995 to 1998. Washington was selected as the second state, and similar research began there in 1998. This report presents the results of principal and teacher surveys conducted in Washington in the spring of 1999. Case study results will be reported separately.

Results of Prior Research

Research in Kentucky indicates that standards-based reforms that include high-stakes testing can be powerful tools to change what is happening in schools and classrooms (Barron & Stecher, 1999; Borko & Elliott, 1998, 1999; McIver & Wolf, 1998, 1999; Stecher & Barron, 1999; Stecher, Barron, Kaganoff, & Goodwin, 1998; Wolf & McIver, 1998, 1999). At the time of the research, Kentucky tested students on reading, writing and science in Grades 4, 7 and 11 and on mathematics, social studies, arts and humanities, and practical living/vocational education in Grades 5, 8 and 11.

The state hoped to drive instruction in particular directions by basing the assessment system (KIRIS) on open-response questions and portfolios rather than multiple-choice questions. The research found that the Kentucky education reform, which included new standards and performance assessments (KIRIS), influenced classroom practices in both elementary and middle schools. The project found evidence of increased professional development related to the tests and the standards, increased coverage of the subjects tested by KIRIS, and increased frequency of standards-based practices. For example, two thirds of fifth-grade teachers reported increasing the time they spent on mathematics, and the greatest increases were in the areas of mathematics emphasized by the standards: geometry and measurement, statistics and probability, and algebraic ideas. Similarly, teachers increased their attention to problem solving and mathematical communication.

However, we found no evidence of associations between practices and increased KIRIS scores. In addition, teachers appeared to focus more on the tests than on the standards the tests were supposed to represent. One consequence of such "teaching to the test" was that curriculum coverage varied significantly from one grade to the next in parallel with the subject matter emphasis of KIRIS. For example, students in fourth and seventh grades received more instruction in reading, writing and science, while students in fifth and eighth grades received more instruction in mathematics, social studies, and arts/humanities. Furthermore, the use of performance assessments that more fully represented the domains of interest, had mixed effects, as well. For example, to promote writing about mathematics, fifth-grade teachers increased the amount of time students spent on mathematics at the expense of time spent on other subjects such as science. Similar shifts in emphasis occurred within specific subject areas. For example, the KIRIS

writing test focuses on short written pieces, and teachers focused on that type of writing at the expense of other types of writing.

The case studies focused on a dozen teachers whose mathematics and writing instruction was deemed by others to be exemplary (Borko & Elliott, 1998, 1999; McIver & Wolf, 1999; Wolf & McIver, 1999). Observations and interviews were used to identify features of reform that supported such exceptional practice, for example, an extensive network of professional development opportunities and a belief at the school level of the importance of ongoing support for teacher learning. They also identified elements of the accountability system that frustrated even the best teachers. For example, fifth-grade teachers reorganized their mathematics curriculum against their better judgment in order to produce enough pieces to complete students' mathematics portfolios by the required date.

Current Study

In 1998 we began conducting similar investigations in Washington focusing on Grades 4 and 7, which are the elementary and middle school grades at which the WASL tests are administered. We adapted the surveys used in Kentucky to reflect the structure of the Washington education reform. In some cases this involved merely changing terminology and retaining the fundamental framework of the questions. In other cases where the conditions in the two states were substantially different, it required developing whole new items. Separate surveys for principals and teachers were drafted, field tested and revised during the fall of 1998 and the winter of 1999. The final surveys were administered to a representative sample of elementary and middle school principals and teachers in Grades 4 and 7 in the spring of 1999. Data were tabulated and analyzed in the summer and fall, and the results are presented here.

In 1999-2000, as the Washington reform is more fully implemented, we will conduct a similar set of surveys focused on changes in practice. The goal of these efforts will be to determine if elementary and middle school principals and if fourth- and seventh-grade teachers are adapting their practices as they become more familiar with the standards and assessments and as the accountability system moves closer to completion. We also will compare results from the two states to see if differences in the structure of the programs or implementation strategies are associated with differences in their impact on practice.

Organization of the Report

The remainder of the report is organized in six sections. The first section provides background information about the Washington education reform for readers who are unfamiliar with the state's standards, assessments and plans for accountability. The second section describes our research methods. The third section presents results from principals, focusing on administrative changes. The next section describes the results from teachers. Teacher responses are ordered thematically around the topics of preparation for and implementation of the reform, the impact of the reform on instruction in writing, and the impact on instruction in mathematics. Where appropriate, we separate the responses from fourth-grade teachers (who were responsible for both writing and mathematics instruction), seventh-grade writing teachers and seventh-grade mathematics teachers. The fifth section examines the relationship between survey responses and WASL scores. The final section is a discussion of the implications of these data for education reform in Washington and elsewhere.

Washington Education Reform

In 1992, the Washington legislature created the Commission on Student Learning (CSL), with responsibility for developing a standards-based accountability system for the state (SSB5953). The CSL was asked to develop content standards, create appropriate assessments, and recommend an accountability system to monitor each school's progress in achieving the standards. The commission's work ultimately led to the Student Learning and Improvement Act (ESHB 1209), which the legislature passed in 1993; this is now known as the Education Reform Act. The legislature provided $75 million in funding to support the Education Reform Act during its first two years, the largest such educational expenditure in the state's history (Consortium for Policy Research in Education, 1996).

The Education Reform Act declares that improving student achievement will require:

1. Establishing what is expected of students, with standards set at internationally competitive levels;
2. Parents to be primary partners in the education of their children and to play a significantly greater role in local school decision making;
3. Students taking more responsibility for their education;

4. Time and resources for educators to collaboratively develop and implement strategies for improved student learning;
5. Making instructional programs more relevant to students' future plans;
6. All parties responsible for education to focus more on what is best for students; and
7. An educational environment that fosters mutually respectful interactions in an atmosphere of collaboration and cooperation. (Bergeson, Yoshitomi, & Butts, 1999, p. 3)

Washington's education reform is similar to standards-based accountability systems in other states that have three major components: a set of standards, measures of student performance, and a system of incentives for improvement (*Education Week*, 1997, 1999). Washington's system includes statewide standards for what students should know and be able to do, called the Essential Academic Learning Requirements (EALRs), tests to evaluate student knowledge and progress towards standards, called the Washington Assessment of Student Learning (WASL), and an as-yet-to-be-developed mechanism to hold schools accountable for student performance. The WASL assessments include both multiple-choice and open-response measures in roughly equal proportions. Another distinguishing feature of the reform is that Washington is implementing it gradually over a decade, beginning with the setting of standards, proceeding to the gradual introduction of assessments, and finally the development of an accountability system that addresses goals, progress, and consequences for schools.

Standards

The 1993 legislation established four basic education goals for students. All students shall:

1. Read with comprehension, write with skill, and communicate effectively and responsibly in a variety of ways and settings;
2. Know and apply the core concepts and principles of mathematics; social, physical and life sciences; civics and history; geography; arts; and health and fitness;
3. Think analytically, logically, and creatively, and integrate experience and knowledge to form reasoned judgements and solve problems;
4. Understand the importance of work and how performance, effort, and decisions affect future career and educational opportunities.

Building upon these basic education goals, the legislation also mandated the development of more specific standards for academic and technical skills and knowledge. To this end, the Commission on Student Learning (CSL) established EALRs in eight content areas: reading, writing, mathematics, listening/communication, science, social studies, health/fitness, and the arts. In addition, they designated three benchmark grades at which performance was to be assessed: fourth grade (elementary), seventh grade (middle school) and tenth grade (high school).

The EALRs themselves are written at a relatively high level of generality. For each subject there are three to five broad performance standards. Table 1 contains the broad standards for writing and mathematics. Each standard is elaborated by descriptions of general student behaviors that would demonstrate mastery of the standard. Table 2 illustrates the descriptions of student behaviors that accompany the first standards in writing and mathematics. In addition, for each behavior there are more detailed benchmarks describing behaviors that would be expected for students in Grades 4, 7 and 10. Examples of the benchmarks for the first writing and mathematics standards are contained in Appendices A and B, respectively.

Assessments

Many changes were made in the state assessment system as part of the education reform. The cornerstone of the new system is the Washington Assessment of Student Learning (WASL), which was developed specifically for the state by a

Table 1

EALR Standards in Writing and Mathematics

Writing	Mathematics
1. The student writes clearly and effectively.	1. The student understands and applies the concepts and procedures of mathematics.
2. The student writes in a variety of forms for different audiences and purposes.	2. The student uses mathematics to define and solve problems.
3. The students understands and uses steps of the writing process.	3. The student uses mathematical reasoning.
4. The student analyzes and evaluates the effectiveness of written work.	4. The student communicates knowledge and understanding in both everyday and mathematical language.
	5. The students understands how mathematical ideas connect within mathematics, to other subject areas, and to real-life situations.

Table 2

EALR Details in Writing and Mathematics

The student writes clearly and effectively.	The student understands and applies the concepts and procedures of mathematics.
To meet this standard, the student will:	To meet this standard the student will:
1.1 develop concept and design (develop a topic or theme; organize written thoughts with a clear beginning, middle and end; use transitional sentences and phrases to connect related ideas; write coherently and effectively)	1.1 understand and apply concepts and procedures from number sense (number and numeration, computation, and estimation)
1.2 use style appropriate to the audience and purpose (use voice, word choice, and sentence fluency for intended style and audience)	1.2 understand and apply concepts and procedures from measurement (attributes and dimensions, approximation and precision, and systems and tools)
1.3 apply writing conventions (know and apply correct spelling, grammar, sentence structure, punctuation, and capitalization)	1.3 understand and apply concepts and procedures from geometric sense (shape and dimension, and relationships and transformations)
	1.4 understand and apply concepts and procedures from probability and statistics (probability, statistics, and prediction and inference)
	1.5 understand and apply concepts and procedures from algebraic sense (relations and representations, and operations)

commercial contractor. The test includes several different types of items designed to measure student performance and progress towards the standards. In the areas of reading, mathematics, and listening, students answer multiple-choice, short-answer, and extended-response questions. In writing, students are required to write essays in response to specific prompts. All WASL assessments are untimed, and accommodations are made for students with special needs.

In addition to the WASL, the state also administers norm-referenced standardized tests at selected grade levels. The state recently changed standardized tests, adopting the Iowa Tests of Basic Skills (ITBS), and the Iowa Tests of Educational Development (ITED). At the time of this survey, these tests were administered in Grades 3 and 8 in the subjects of reading and mathematics, and in Grade 11 in the subjects of reading, language arts and mathematics. Beginning in 1999-2000, the tests will be administered in Grades 3, 6 and 9. Most school districts also administer other exams in addition to those required by the state.

Classroom-based assessments (CBAs) are another element of the state assessment system. The state has developed materials and provided some funds to schools to support improved classroom assessments related to the WASL. Emphasis has been given to performance-based measures, which may include examples of student work, such as experiments or projects, or information provided through oral interviews or presentations. The goal of classroom-based assessments is to help teachers respond to individual students' strengths and weaknesses, some of which may be difficult to assess with the WASL. The state believes that CBA is an essential component of a good instructional program because such assessments "can be tailored to the varying developmental needs and learning styles of students. Classroom-based assessments, along with regular exams, quizzes and projects, are intended to ensure that learning continues throughout the school year" (Office of the Superintendent of Public Instruction, 2000, February 15).

The state also promoted improved classroom-based assessments through the development and distribution of assessment Tool Kits and a piece of software (CD-ROM) called NCS Mentor®. The Tool Kits are intended to provide teachers with strategies to assess student performance that are aligned with the standards. The Tool Kits include checklists of skills, observation strategies, models of written tasks, rating scales for student work, and generic protocols for conducting personal interviews and other forms of oral communication (Washington State Commission on Student Learning, 1997b). The Tool Kits also include content frameworks to help teachers align their classroom activities and instruction to the EARLs. NCS Mentor® offers teachers interactive help in aligning their own tests with the EALRs.

Washington is implementing its education reform gradually over a period of a decade (unlike many states—including Texas, Kentucky, and North Carolina—which implemented standards-based reforms rapidly). For example, the EARLs for reading, writing, mathematics, and listening were developed first in 1995. The EARLs for science, social studies, health/fitness and the arts followed in 1996. The implementation of the WASL has been even more gradual. The fourth-grade WASL in reading, writing, mathematics and listening was offered for the first time on a voluntary basis in 1996-97, and it became mandatory the following year. For seventh-grade students, the assessments were voluntary in 1997-98, and will be mandatory in the 2000-01 school year. The complete assessment system will be fully implemented by 2008 (see Table 3).

Table 3

Washington Assessment of Student Learning (WASL) Implementation Timeline

Subject(s)	School and grade level	Available for voluntary use	Required
Reading, writing, listening, mathematics	Elementary (Grade 4)	Spring 1997	Spring 1998
	Middle (Grade 7)	Spring 1998	Spring 2001
	High (Grade 10)	Spring 1999	Spring 2001
Science	Elementary (Grade 5)	Spring 2002	Spring 2005
	Middle (Grade 8)	Spring 2000	Spring 2001
	High (Grade 10)	Spring 2000	Spring 2001
Social studies	Elementary (Grade 5)	Spring 2003	Spring 2006
	Middle (Grade 8)	Spring 2003	Spring 2006
	High (Grade 10)	Spring 2003	Spring 2006
Arts	Elementary (Grade 5)	Spring 2004	Spring 2008
	Middle (Grade 8)	Spring 2004	Spring 2007
	High (Grade 10)	Spring 2004	Spring 2007
Health and fitness	Elementary (Grade 5)	Spring 2004	Spring 2008
	Middle (Grade 8)	Spring 2004	Spring 2007
	High (Grade 10)	Spring 2004	Spring 2007

Following the first voluntary administration of the WASL, a standard-setting committee met to decide what level of performance would constitute accomplishment of the standards in the areas of reading and mathematics in each of the tested grades. They designated four levels of performance for students, two levels representing performance that met or exceeded the standard (designated Level 3 and Level 4, respectively) and two levels representing performance below the standard (Levels 1 and 2). Four levels are used to make the assessment more sensitive to changes in student performance over time and to provide an indication of the distance between a student's performance and the standard. However, for most public reporting purposes results for schools in reading and mathematics are presented only in terms of the percent of students who meet or exceed the standard. The results for the listening and writing assessments indicate only whether the student meets the standard or does not.

Accountability

The third component of Washington's education reform system is school and district accountability. The stated purpose of the accountability system is to improve

student learning and the achievement of the standards by providing a structure of incentives and assistance for schools and districts. Like many other states, Washington's reforms focus on schools and districts—rather than teachers or students—as the units of performance and accountability. The body responsible for oversight and the development of accountability policies is now the Academic Achievement and Accountability Commission (referred to as the A+ Commission). The Commission has specific responsibilities, including adopting and revising performance improvement goals, setting standards, adopting criteria to identify successful schools and those in need of assistance, identifying performance incentive systems, annually reviewing the assessment system, and recommending, by September 2000, accountability policies, including state intervention strategies for low-performing schools.

According to educators in Washington, the Commission is likely to recommend an incremental approach on the part of the state towards intervention in low-performing schools. The initial responsibility to help schools will probably reside with districts, but if the district action fails to improve performance in a school, the state will intervene. However, it is not yet clear what the extent of this intervention will be.

Professional Development

The final component of the state's educational reform is professional development for teachers. Sixteen "Regional Learning and Assessment Centers" were established across the state to provide assistance to local schools and districts. The Centers offer a range of professional development opportunities on a fee basis, including training related to the state standards, curriculum alignment, and the new statewide assessments. The state also encouraged districts and schools to send study teams to receive training in classroom-based assessment strategies developed by Richard Stiggins (1996). In the second year of the reform, the state distributed 10,000 copies of Stiggins' book to participating schools and districts.

The Education Reform Act also allocated additional resources in the form of Student Learning Improvement Grants (SLIGs) that districts use for professional development. Districts that applied received a per pupil allocation of funds for professional development in the 1997-98 school year. In 1998-99, the program was modified to provide "Learning Improvement Allocations" to all school districts to "enhance the ability of instructional staff to teach and assess the EALRs for reading,

writing, communication and math . . . [with] special emphasis . . . given to successful teaching of reading" (Bergeson, Yoshitomi, & Butts, 1998). In 1999-2000 the monetary awards were made contingent upon districts adding three professional development days to the school calendar to focus on improving student learning consistent with the education reform.

WASL Results

Initial results from WASL showed that only a minority of students were achieving the rigorous standards embodied in the state reforms (see Table 4). Fewer than one quarter of the students met the standards in mathematics in the first year that WASL was administered. Fewer than one half met the standards in reading or writing. The most recent WASL results were more encouraging, showing gains in the percentage of students meeting the standards in mathematics, reading and listening in elementary and middle schools. Of course, there is still much room for improvement. Approximately one third of fourth graders and more than one half of seventh graders tested at Level 1 this year. Writing performance has been mixed. Fourth-grade writing scores have dropped for the second consecutive year, but there was improvement among seventh graders.

Other Elements of Education Reform

Other components have been added to the reform during the past couple of years, including an annual second-grade reading assessment, specific reading improvement goals for fourth grade, and supplemental reading teachers for low performing schools (Bergeson et al., 1999). In 1998 the state adopted a second-grade reading assessment to provide an early identification of students with potential reading problems. Districts must select a test from those approved by the state, and

Table 4

Statewide WASL Results (percent of students meeting standard)

	Fourth grade			Seventh grade[a]		
Subject	1997	1998	1999	1997	1998	1999
Mathematics	21	31	37	—	20	24
Reading	48	56	59	—	38	41
Writing	43	37	33	—	31	37
Listening	62	71	71	—	80	87

[a]Grade 7 WASL was introduced in 1998 on a voluntary basis.

teachers administer it individually to all second-grade students. The purpose of the test is to identify students who are "substantially below grade level" so they can receive supplemental reading instruction.

The legislature also passed new regulations requiring all districts to establish fourth-grade reading goals on WASL to be achieved by the end of the 2000-01 school year. Each district must choose either 1996-97 or 1997-98 as a baseline against which to measure progress. They must establish a reading improvement goal that would result in 25% fewer fourth-grade students failing to meet the standard in the 2000-01 school year. For example, if 60% of students failed to meet the standard in the baseline year, the goal for 2001 would be a drop of at least 25% in this percentage—that is, no more than 45% failing to meet the reading standard. Districts must establish similar goals for mathematics in fourth grade and seventh grade by 2001; these goals must be met by the end of the 2003-04 school year.

The newest element of the reform is the Washington Reading Corps. This program provides grants to districts to implement "proven research-based mentoring and tutoring programs" in reading for low-performing students (Bergeson et al., 1999, p. 43). Such programs can take place before, during or after school, on weekends or during vacation times.

Methodology

In the spring of 1999, we surveyed a representative sample of about 150 principals and about 400 teachers from across the state of Washington. Surveys were sent to elementary and middle school principals as well as to the teachers in the WASL-tested grades (fourth and seventh grades) at the same schools. This report summarizes the results of the survey component of the project. Case studies of exemplary teachers in these grades and subjects were also conducted, and companion reports will describe the case study findings.

Sampling

Schools in Washington were stratified based on the type of community in which the school was located, and a stratified random sample of schools (based on proportional representation of the strata) was selected. The three strata were urban, urban fringe/large town, and small town/rural. Schools with fewer than 20 students in the tested grade were excluded from the sampling frame, as were schools with recent changes in their service areas. Middle schools were limited to schools that

administered WASL on a voluntary basis. For each of the survey populations (elementary schools and middle schools), 70 schools were selected. No school was chosen for more than one sample.

A letter was sent to the principal of each school at the beginning of 1999 explaining the study and requesting the names of the instructors teaching the identified grade (and, in middle schools, the identified subject). Principals were subsequently contacted by telephone to retrieve these names. Ninety-four percent of the principals in the sampled schools provided the requested information. In small schools, all teachers in the target grade levels (fourth and seventh grades) were included in the study. In large schools, it was necessary to sample teachers in order to use the available resources to collect data from a sizeable number of schools. In elementary schools with more than three teachers, a random sample of three teachers was selected. In middle schools with more than two math or writing teachers, random samples of up to two writing teachers and up to two math teachers were selected.

Principals and teachers were then contacted by mail. The contact letter explained the study and asked for their participation. Enclosed with the request was a letter from the Superintendent of Public Instruction urging respondents to cooperate, a copy of the survey to be completed, a return envelope, and a $10 gift certificate for purchasing books or other instructional materials. Principals and teachers could keep the gift certificate regardless of whether they returned the survey.

A total of 108 principals (77%) and 277 teachers (69%) returned completed surveys. Table 5 contains the survey completion rates for each of the four samples. The median tenure for principals who responded was 10 years at their current school. On average, the teachers who completed surveys had about a dozen years of experience; the median tenure for fourth-grade teachers was 17 years, and for seventh-grade teachers it was 9 years. Both groups of teachers had acquired one half of their teaching experience at their current school. About one half of the teachers had master's degrees. Teachers in the sample resembled the teachers in the state as a whole in terms of experience and education level, based on recent research conducted by the legislature (Joint Legislative Audit and Review Committee, 1999, pp. 34-35).

Table 5

Survey Samples and Response Rates

	Elementary school (Grade 4)		Middle school (Grade 7)	
Respondent	Sample size	Response rate	Sample size	Response rate
Principals	70	75.7%	70	78.6%
Teachers	179	74.9%	221	64.7%

In terms of subject matter, very few teachers in either grade taught only writing or only mathematics. All fourth-grade writing teachers were responsible for multiple subjects: reading, writing, mathematics, communication, social studies, and science. Many fourth-grade writing teachers also taught arts, health, and/or other subjects. At the seventh-grade level, almost all writing teachers also taught reading and communication; only 9% of teachers who identified themselves as writing teachers did not teach reading. In addition, 70% of seventh-grade writing teachers also taught social studies, mathematics, science, and/or arts.

Similarly, the mathematics teachers were multi-disciplinary. All fourth-grade mathematics teachers also taught reading, writing, social studies and science. One half of the seventh-grade mathematics teachers also taught other subjects. Eight percent taught reading and mathematics exclusively while 41% taught reading, social studies, science, arts, and/or health in addition to mathematics.

Survey Development

The teacher surveys were similar to surveys the project developed in Kentucky the previous school year; however, they were modified to reflect the language and priorities of the Washington reform. The teacher surveys collected information about teachers' familiarity with and opinions about the state reform, their participation in professional development, and their classroom practices. In terms of practice, the survey asked teachers about their allocation of time to different subjects, their teaching strategies, and the topics they covered within writing and mathematics. Additionally, teachers reported recent changes in instruction and the major factors that influenced instructional changes, including the state reform.

Questions about the content of the writing and mathematics curriculum were based on the EALRs. The EALRs in writing specify four broad areas of writing proficiency. Students should write clearly and effectively, write in a variety of forms for different audiences and purposes, understand and use the steps of the writing

process, and be able to analyze and evaluate the effectiveness of written work (Washington State Commission on Student Learning, 1997a). These four areas are subdivided into 14 behaviors, ranging from "develop concept and design" to "seek and offer feedback." The survey asked teachers about their emphasis on these 14 writing behaviors, the teaching strategies they use, and the types of written assignments they give.

In mathematics, the EALRs specify five broad areas of proficiency. Students should be able to understand and apply the concepts and procedures of mathematics, use mathematics to define and solve problems, use mathematical reasoning, communicate knowledge and understanding both in everyday and mathematical language, and understand how mathematical ideas connect within mathematics, to other subject areas and to real-life situations. The first area of proficiency emphasizes mathematics content and curriculum: number sense, measurement, geometric sense, probability and statistics, and algebraic sense. The rest of the proficiencies focus on mathematical processes, such as "investigate situations," "analyze information," and "represent and share information." The surveys asked teachers about these areas of emphasis and about specific instructional activities that occur in their classrooms. We also asked teachers how much their actions had changed between the 1997-98 and 1998-99 school years.

Principals provided information about education reform at both the district and school levels. At the district level, they responded to questions about curriculum, standards, assessments, and accountability. At the school level, they responded to questions about implementation (e.g., how the respondent learned about the reform, whether he or she endorsed its principles, etc.), impact (e.g., changes made as a result of the reform, factors that were most influential, etc.), and testing (e.g., test preparation practices).

Most of the items on both surveys focused on specific behaviors, but we also asked for teachers' and principals' opinions about a number of issues, including the Washington assessments and their impact on schools, classroom practices, and student learning. The surveys also contained questions related to respondent background and professional development. Most of the survey questions were presented in a closed format. Respondents were asked to provide numerical answers or to select one option from a predetermined set of options (e.g., 3-, 4-, and 5-point Likert scales, and yes/no questions). A few questions were open-ended, permitting principals and teachers to write in their own responses. For most questions about

practice, respondents were asked about current behaviors (during the 1998-99 school year) and about changes during the past two-year period (1997-98 and 1998-99 school years). Only respondents who had at least two years of experience in their present position answered questions about changes in practice.

WASL Scores

In order to investigate relationships between school and classroom practices and student achievement, we obtained school-level WASL scores and student demographic information for 1998-1999 from the Office of the Superintendent of Public Instruction. The data file included the number of students tested in each subject, raw WASL scores, and the number achieving the standard in each subject. The file also included student demographic information at the school level, including race/ethnicity and eligibility for free or reduced-price lunches.

Data Analysis

For most questions on the principal survey, we computed frequency distributions of responses at each point on the response scale. For questions requiring a numeric response, means and standard deviations were calculated.[1] Analysis of the open-response questions required coding and tabulation of the individual principal and teacher responses.

Because we sampled teachers in the larger schools (rather than surveying all teachers), we had to weight teachers' responses to obtain results that reflected all teachers in Washington (fourth-grade teachers, seventh-grade writing teachers, and seventh-grade mathematics teachers). The weights insured that teachers in large and small schools were given the proper influence in the descriptive statistics. The weight assigned to each teacher was the product of the inverses of the probability that the school would be selected, the probability the teacher would be selected, and probability that the sampled individuals would participate (complete the survey).

The purpose of the surveys was to obtain early indications of teacher and principal opinion about the Washington education reform, and to judge the reform's initial impact on practice. For this reason, the surveys were broad in nature and many questions were asked. The data collection was designed to provide a large

[1] The standard error is a statistic that can be used as a guideline to judge the accuracy of the reported percentages. In this study accurate estimates of the standard error are difficult to obtain because teachers were sampled within schools, and the responses of teachers within the same school cannot be assumed to be independent.

amount of information from a number of groups rather than to maximize our power for making specific comparisons between groups. Thus, we do not focus much attention on testing the significance of differences between specific groups of principals or teachers. As a general rule of thumb, a difference between two percentage estimates of 15-20 points would be large enough for statistical significance at the 0.05 level (without a correction for multiple comparisons). However, given the design of the study and the large numbers of comparisons being made, most standard statistical tests properly applied would fail to detect many real differences. Instead we focus on differences that seem large enough to be of practical importance. The downside of this approach is that it is almost certain that there will be a small number of comparisons that we highlight that are in fact due to chance. However, given the nature of the study, this weakness was preferred to the option of missing many important comparisons due to a stringent significance threshold. We did use the significance levels as a guideline for interpreting results.

As is the case with all survey research, several factors may threaten the validity of the conclusions reached in this study. There may be selection effects because not all principals provided us with teachers' names, and not all principals or teachers chose to participate. Although the response rates were reasonably high, these refusals may have introduced some degree of bias into the reported results. One must also be cautious about self-reported data. Respondents may have answered in ways they considered socially desirable, leading to results that do not reflect teachers' true beliefs.

To avoid overly complex language we will often omit explicit reference to the self-reported nature of the results. "One half of the teachers have masters' degrees" is far easier to read than "one half of the fourth-grade teachers in our sample reported that they have masters' degrees." The reader should remember that all these results are based on principal and teacher survey responses. In addition, we occasionally refer to the results for "seventh-grade teachers" instead of "seventh-grade teachers who teach writing or mathematics." The reader should keep in mind that we surveyed only writing and mathematics teachers at the seventh grade.

To simplify the presentation of results from scales with four or more response options, we often will combine the top two levels into a single category. For example, the survey asked teachers' opinions about the degree to which reform elements promoted better instruction and increased student learning using a 4-point scale: *none, a small amount, a moderate amount,* and *a great deal.* If this does not distort

the pattern of responses, we will combine the top two categories, "moderate amount" and "great deal," and report the percentage of teachers who indicated "a moderate amount or a great deal." In the few cases where there were differences between the distribution of responses in the top two categories, we will present the disaggregated responses.

Finally, we used multiple regression analysis to investigate the relationship between WASL scores and school practices as reported on the principal and teacher surveys. The question we examined was whether school practices were significantly related to student achievement, controlling for differences in school size and student demographics. The analysis proceeded in three steps. First, using data on all schools in the state, we modeled WASL scores as a function of schools size and student demographics. The variables included in this analysis are shown in Table C.1 and the results are shown in Table C.2 in Appendix C. All variables that were significantly related to WASL scores in the statewide analysis were included in subsequent analyses of our survey sample. Second, we restricted the analysis to our survey sample of elementary and middle schools. Using regression, we examined the relationships between background factors and WASL scores separately in these two groups of schools. The overall the results were consistent enough to warrant pooling our samples of elementary and middle schools. For example, in mathematics the effects of our predictors were almost identical at the fourth and seventh grades. The pooled sample included 106 schools with both principal and teacher survey responses.

The third step was to investigate the relationship between WASL scores and school and classroom practices from the surveys, controlling for the background factors that were significant in the statewide analysis. We included a subset of survey responses that reflected important aspects of the reform. From the principal survey, we included the amount of SLIG money received, the existence of district standards in the four subjects tested by WASL, the perceived degree of curriculum alignment in these subjects, and the number of specific activities the school had initiated in response to WASL. From the teacher survey we included measures of teaching experience, professional development, the degree to which professional development focused on Washington's education reform, curriculum alignment, teachers' understanding of the EALRs and the WASL, and WASL-specific preparation activities in writing and mathematics. A list of the specific items and response options included in the analysis will be found in Appendix D.

Generalizability of Findings

The sample was drawn to maximize the chances of obtaining representative groups of Washington elementary school principals, middle school principals, fourth-grade teachers, seventh-grade writing teachers and seventh-grade mathematics teachers. To test the validity of the sampling process, we compared key features of schools with completed principal surveys with schools in the state as a whole on four variables: school enrollment in the tested grade, percent minority in the school, WASL mathematics scores and WASL writing scores. The school-level means were similar to the population means for elementary schools and middle schools on these variables (see Table 6).

Results: Elementary and Middle School Principals

Almost all principals reported that they had a good understanding of the Washington education reform, and they endorsed its central goals for students. Much of the professional development they participated in addressed the EALRs, WASL and classroom-based assessments. Only a small percentage of the principals were directly involved in state committees helping to develop or implement the reform, but most principals participated on district or school committees, particularly committees working to align curriculum with the EALRs.

According to principals, most districts added or modified their standards and assessments to bring them in line with the EALRs. Most principals thought the alignment between local policies and the EALRs was good, particularly in the WASL-tested subjects. One consequence of the reform is that the amount of testing is rising in both elementary and middle schools. In addition to the state-mandated tests, districts are increasing local testing, using both commercial tests and locally developed tests.

Table 6

Comparison of State and Sample (mean values)

	Elementary school (Grade 4)		Middle school (Grade 7)	
Feature	State	Sample	State	Sample
Percent minority	24.7	24.3	21.4	21.8
Grade enrollment	70.9	76.7	171.3	161.4
WASL math[a]	30.6	30.6	18.9	16.8
WASL writing[a]	35.8	34.2	30.1	28.7

[a] Percent meeting standard.

The vast majority of principals reported that the Washington education reform promoted better instruction and increased student learning, and they indicated that the EALRs and WASL were the most influential elements of the reform. Principals felt widespread pressure for students to do well on all outcome indicators, but they felt the greatest pressure for students to perform well on the state assessments (WASL and the state norm-referenced test). The greatest perceived pressure to perform well came from district administrators, the media and the Office of the Superintendent of Public Instruction (OSPI).

According to principals, education reform led to valuable professional development opportunities for teachers, and school-initiated professional development focused more on curriculum alignment, the EALRs, and WASL than on classroom-based assessment or district tests. Schools took a number of actions specifically designed to improve WASL scores, including providing professional development, sharing information about WASL, trying to motivate teachers and students, changing school schedules, and improving curriculum and instruction. Most principals indicated that test preparation activities accounted for most past WASL score gains, although they also believed that better classroom-based assessment would lead to gains in the future.

Principals' Understanding of Educational Reform

Almost all principals reported that they understood the central elements of the educational reform well or very well. Table 7 shows that over 80% of principals were comfortable with their knowledge of the EALRs, WASL and the alignment of curriculum and instruction. Almost as many were confident in their knowledge of classroom-based assessment.

Table 7

Principals' Understanding of Education Reform (percent of principals who understand well or very well)

Aspect of reform	Elementary school	Middle school
Washington student assessment (WASL)	90	92
Essential learnings and benchmarks (EALRs)	86	96
Aligning curriculum and instruction with EALRs	80	88
Classroom-based assessments (e.g., Stiggins training, assessment Tool Kits)	80	76

Not only did principals understand the reform, but they endorsed its key goals for students. As Table 8 shows, about three quarters of principals believed the goals of the reform were attainable, and an even greater percentage believed the standards set by the EALRs were appropriate.

Principals reported participating in a large amount of professional development during the 1997-98 and 1998-99 school years, much of it focusing on the reform. The median elementary principal spent 80 hours in professional development during the past two years, with 65 hours of that time related to Washington's education reform. Similarly, the median middle school principal spent 80 hours in professional development during the past two years, and 50 of those hours were related to reform. In terms of emphasis, more than 80% of principals reported that their professional development placed either a moderate amount or a great deal of emphasis on the EALRs, WASL, and curriculum alignment. Slightly fewer (72%) said their professional development emphasized classroom-based assessment.

Few of the principals we surveyed served on any state committees responsible for planning or implementing the reform, but many served on reform-related district committees and one half or more served on committees at their school. Table 9 shows that most principals were directly involved in aligning curriculum and instruction with EALRs at the district and school levels. A slightly higher percentage of middle school principals than elementary school principals participated in district-level planning committees of each type.

Alignment of Standards, Assessments and Curriculum

Many districts had content standards in the core subject areas prior to the adoption of the EALRs, and almost all districts took actions to adopt or revise

Table 8

Principals' Opinions About Reform Goals (percent of principals who somewhat agree or strongly agree)

Statement	Elementary school	Middle school
The EARLs are appropriate for the benchmark grade levels (Grades 4, 7 and 10)	87	88
The goals of Washington's education reform are attainable (e.g., all students will be able to think analytically, logically and creatively)	79	72

Table 9

Principal Service on Committees Related to Education Reform (percent of principals)

Committee	Elementary school		Middle school	
	District	School	District	School
Alignment of curriculum and instruction with EALRs	43	63	50	76
Developing EALRs or related materials	33	51	40	60
Preparing classroom based assessment materials	18	57	26	56
Developing WASL or related materials	12	53	32	60
Developing accountability system	14	53	32	50

standards after the EALRs were developed.[2] More than two thirds of the elementary school principals indicated that their districts had standards in reading, writing and mathematics prior to the adoption of the EALRs (see Table 10). The percentages were lower for the other subjects, but in every subject at least one third of the elementary principals confirmed the existence of district standards prior to the EALRs. The percentages were lower for middle school principals, but the pattern was similar.

After the EALRs were adopted, almost all districts took actions to bring local standards in line with state standards, either by developing new standards or revising existing ones. As Table 10 shows, 87% or more of principals indicated that

Table 10

Existence of District Standards (percent of principals)

Subjects	Had district standards prior to EALRs		Revised or developed standards since EALRs	
	Elementary	Middle	Elementary	Middle
Reading	76	47	87	94
Writing	66	53	89	96
Mathematics	79	44	90	90
Communication	36	29	88	87
Social studies	53	40	84	82
Science	61	40	79	87
Arts	43	24	77	66
Health and fitness	45	28	63	71

[2] The surveys were sent to a representative sample of elementary and middle school principals, and the numbers in the table generalize to all principals in the state (within the margin of sampling error). They do not necessarily generalize to all districts in the state.

their district took actions to revise or develop standards in the four subjects currently tested by WASL. Fewer, but still many, principals reported having district standards in subjects not tested by WASL.

As a result of these actions, most principals believed that their districts' standards were aligned with the EALRs, particularly in the WASL-tested subjects. As Figure 1 shows, in reading, writing and mathematics more than 90% of principals reported their districts' standards to be somewhat well aligned or very well aligned with the EALRs. Over 80% of principals thought their districts' assessments were aligned with WASL in these three subjects, as well. The values were slightly lower for communication/listening. In subjects not tested by WASL, between one half and three quarters of principals felt their districts' standards were aligned with the EALRs. Across the subjects, elementary school principals reported their district standards to be more aligned with state standards than did middle school principals; that is, elementary school principals were more likely to report that local standards were *very well aligned*, and middle school principals were more likely to report that local standards were *somewhat well aligned* with EALRs.

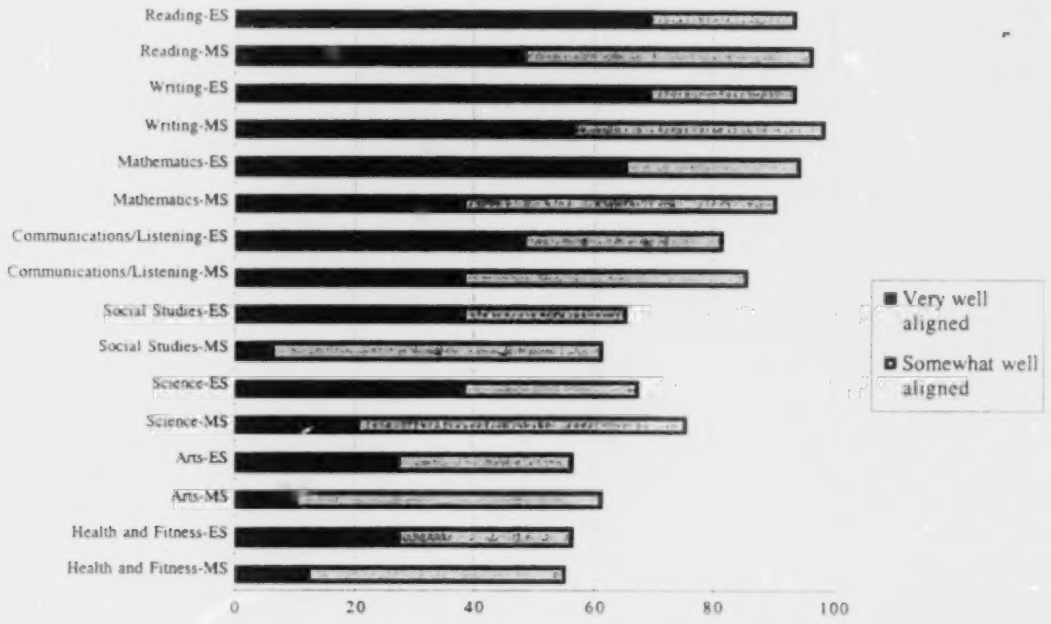

Figure 1. Alignment of state and district standards (percent of elementary school (ES) and middle school (MS) principals indicating district standards are *somewhat well* or *very well* aligned with EALRs).

Almost all principals also reported that their schools' curriculum was well aligned with the EALRs in the WASL-tested subjects. Figure 2 shows that nearly one half or more of principals reported strong alignment between curriculum and the EALRs in the tested subjects. The percentage drops to one quarter or less in the non-tested subjects. The same pattern holds for curriculum in the non-tested grades.

As in the case of standards, school districts also appear to have changed their assessments in response to Washington's education reform. Many have added or revised assessments: 70% of principals reported that their district had implemented new district assessments since the Washington education reform, and 68% changed the content of their assessments to align them with EALRs. Seventy-five percent or more of the principals believe that their districts' tests are aligned with WASL in the four WASL-tested subjects.

Eighty-one percent of principals reported that their district also tested in at least one state-tested subject.[3] Most of the additional district testing was in the

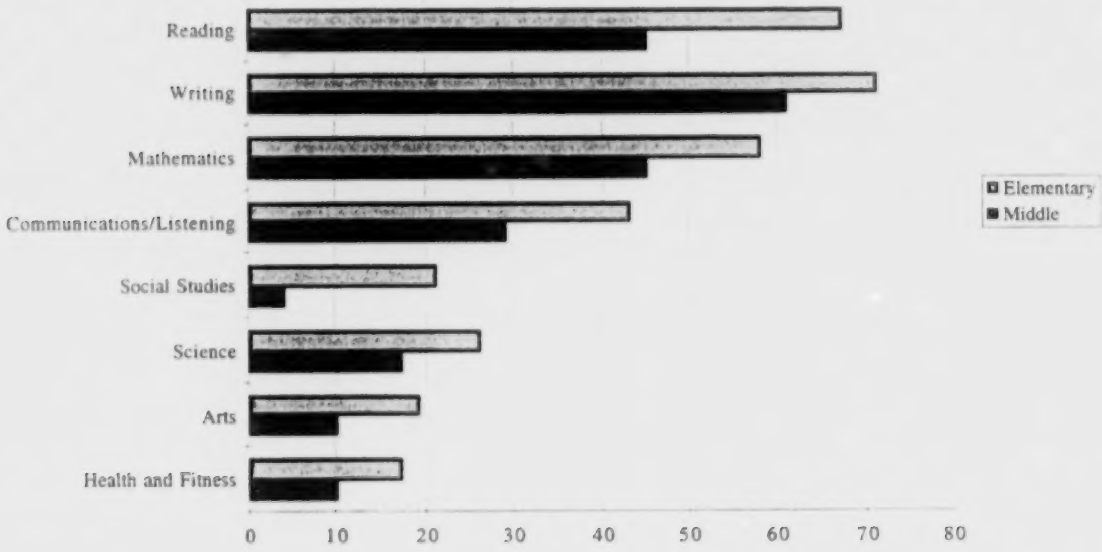

Figure 2. Alignment of school curriculum with standards (percent of principals reporting curriculum very well aligned with EALRs).

[3] During the 1998-99 school year, WASL tests in reading, writing, mathematics, and communication were administered in Grades 4 and 7, and ITBS tests in reading and mathematics were administered in Grades 3 and 8. Beginning in 1999-2000, the ITBS will be given in Grades 3, 6, and 9.

subjects of reading, writing and mathematics (in that order). One quarter of principals also reported that their district required student testing in at least one subject not currently tested by the state (e.g., social studies, science, arts, or health fitness).

Overall, the testing burden on schools appears to be increasing. The number of WASL tests being administered is scheduled to increase, and districts are continuing or expanding their own testing programs. About two thirds of principals (64%) said that their district increased existing testing or began implementing new district assessments since the state reform. Only 16% of principals reported that their districts phased out assessments or planned to phase out assessments in the future.

There were some differences in the frequency of district testing in elementary and middle schools. Overall, a slightly higher percentage of elementary school principals (85%) than middle school principals (76%) reported supplemental district testing in at least one subject. The difference was large only in the subject of reading, where 87% of elementary principals reported additional district testing compared to 57% of middle school principals. Most districts that administered their own tests did so in more than one grade level, but fewer than one quarter of principals reported that their district tested students in the first grade.

Districts administered a variety of different types of assessments, including commercially developed and locally developed tests in both multiple-choice and performance formats. Commercial, standardized tests (e.g., Levels, Stanford-9) were the most common; two thirds of the principals whose districts administered tests (67%) used this type of examination. However, more than one half of the principals whose districts administered tests gave locally developed tests, and the majority of these were performance assessments.[4]

Influence of Reform Elements

The vast majority of principals reported that the Washington education reform promoted better instruction and increased student learning. As Figure 3 shows, some elements of the reform were more influential than others. A greater percentage of the principals reported that the EALRs and the WASL exerted a positive influence on instruction than reported a positive influence from classroom-based assessments

[4] Of those who reported district- or school-developed assessments, 48% reported district-designed performance tasks, 26% reported district-designed multiple-choice tests, 31% reported school-designed performance tests, and 11% reported school-designed multiple-choice tests. Some reported more than one type of locally developed test.

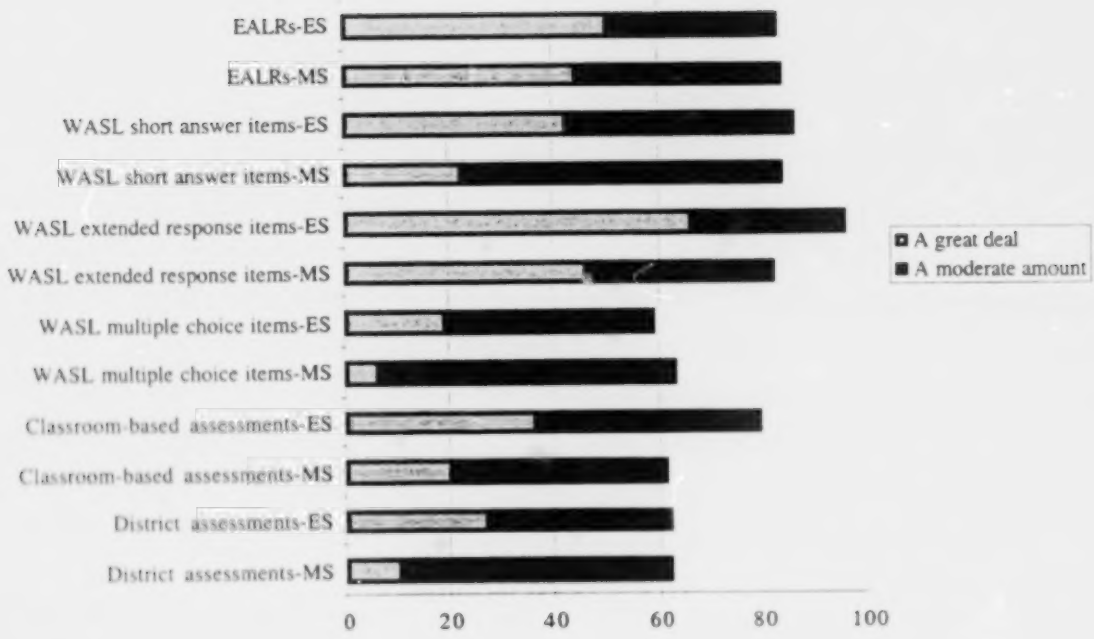

Figure 3. Degree to which reform elements promoted better instruction and increased student learning (percent of principals reporting a moderate amount or a great deal).

or district assessments. WASL short-answer questions and WASL extended-response items had a greater impact than did WASL multiple-choice items. In addition to the difference shown in Figure 3, elementary school principals were more likely than middle school principals to respond that these education reforms had "a great deal" of influence on instruction and student learning.

Almost all principals agreed that teachers need to change their teaching practices to support the education reform (see Table 11). They also believed the reform was encouraging changes that were already in progress.

Table 11

Principals' Opinions About Education Reform (percent of principals who somewhat agree or strongly agree)

Statement	Elementary school	Middle school
Washington's education reform encourages our school to make the changes we were already in the process of making	90	76
Teachers need to change their teaching practices to support Washington's education reform	98	94

Principals felt widespread pressure for students to perform well on all outcome indicators, but they felt the greatest pressure for students to perform well on the state assessments (WASL and the ITBS; see Figure 4). WASL scores were the greatest source of concern; overall 95% of principals felt a moderate amount or a great deal of pressure for their students to perform well on WASL. Since WASL was mandatory in fourth grade in 1997-98 but not in seventh grade it is understandable that a higher percentage of elementary principals than middle school principals felt "a great deal" of pressure for their students to perform well on WASL. However, elementary principals also reported greater pressure for students to do well on the state norm-referenced test (ITBS). The perceived pressure to perform well on district tests and classroom-based assessments is less intense than the pressure to perform well on the state assessments, in part because some districts do not administer district tests.

The pressure to perform well came from many quarters, but district administrators, the media and OSPI were the most prominent sources reported by principals. Figure 5 shows that almost all principals felt a moderate or a great deal of pressure from their district administrators, and over 80% felt strong pressure from the media and from OSPI. About two thirds of principals also felt pressured by local stakeholders: parents and students, school staff and the business community. More

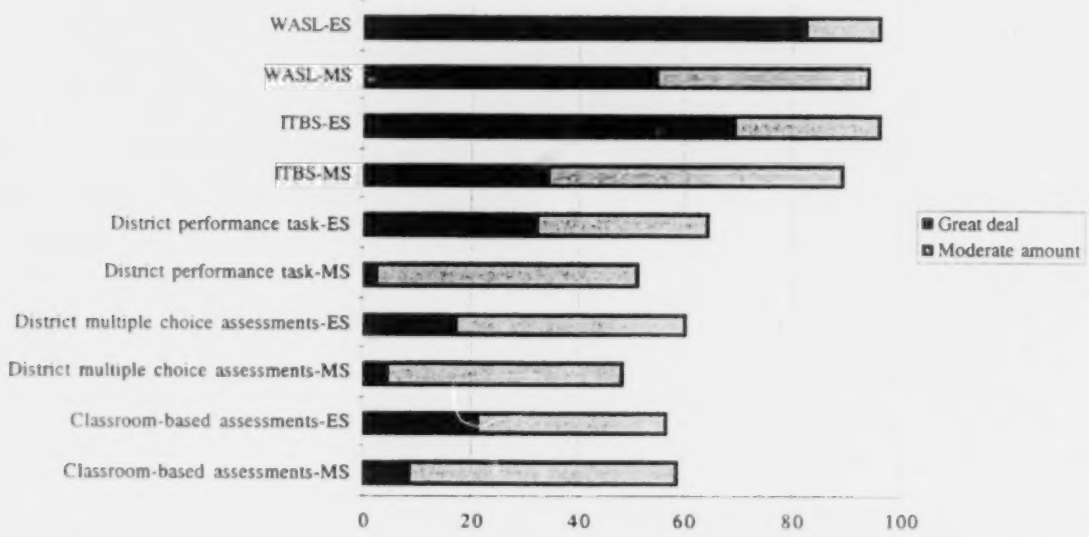

Figure 4. Perceived pressure for students to perform well on selected indicators (percent of elementary school (ES) and middle school (MS) principals reporting a moderate amount or a great deal).

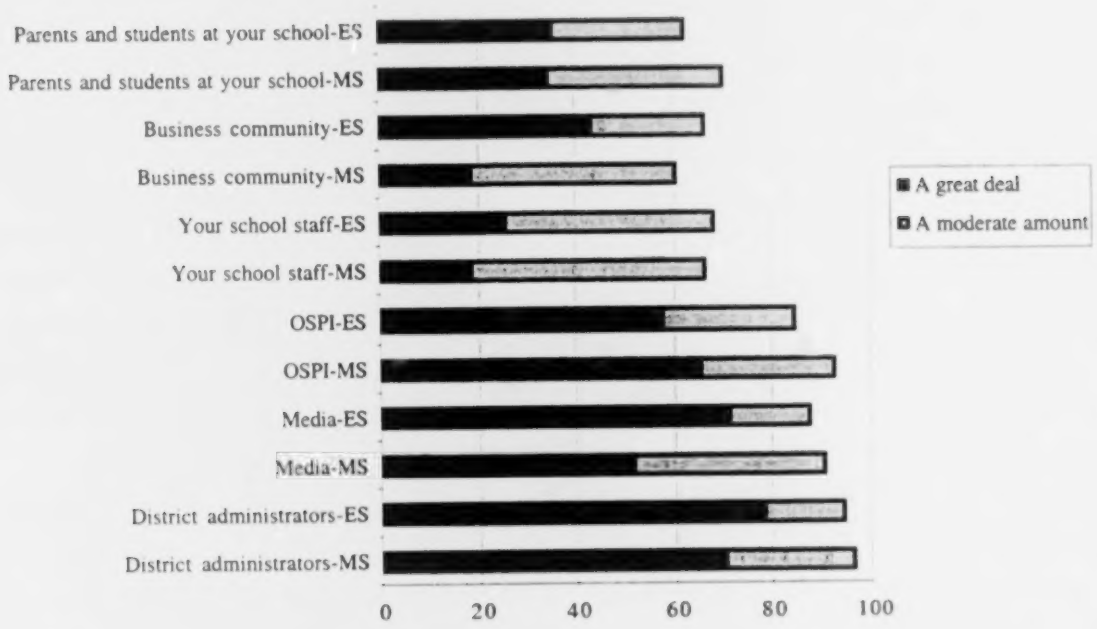

Figure 5. Sources of pressure to improve WASL performance (percent of principals reporting a moderate amount or a great deal of pressure).

elementary principals than middle school principals felt a great deal of pressure, particularly from the business community and the media.

Actions in Response to Reform

Schools initiated a number of actions in response to the Washington education reform, including refocusing their professional development activities and taking a number of specific steps to improve student performance on WASL. Almost all principals reported that education reform led to valuable professional development opportunities for teachers (94% of elementary principals, 90% of middle school principals). One specific instance of this is the Learning Improvement Allocations (LIA) schools received in 1998-99 to support reform-related professional development.[5] The typical elementary school received about $12,500 and the typical middle school received about $14,000 in LIA funds. In addition, about 70% of elementary schools and 45% of middle schools used funds from other sources (e.g.,

[5] Learning Improvement Allocations, formerly known as Student Learning Improvement Grants (SLIGs), totaled $50.4 million in 1999. The 1999 state legislature replaced LIAs with funds for Learning Improvement Days, up to three staff development days for each school.

Title I, Goals 2000) for professional development, leading to an increase in their professional development funding of about 50%, on average.

Most school-initiated professional development focused on curriculum alignment, the EALRs, and WASL. Three quarters or more of the principals indicated that their professional development activities focused on these three components of the reform (see Table 12). Only one half indicated that professional development focused on district testing. It is interesting to note that, with only small exceptions, the emphasis of professional development was similar for middle schools and elementary schools, and for teachers in benchmark grades and teachers in other grades. A lower percentage of schools focused professional development on alignment in mathematics than in reading and writing. Perhaps mathematics had been the focus the previous year, because fewer students met the standards in mathematics than in any other subjects tested by WASL. A substantially lower percentage of middle schools than elementary schools emphasized classroom-based assessments or district assessments than professional development.

Schools have taken a number of other actions to improve WASL scores, including providing professional development, sharing information about WASL, trying to motivate teachers and students, changing school schedules and other related policies, and improving curriculum and instruction. Table 13 shows the

Table 12

Focus of School Professional Development (percent of principals reporting a moderate amount or a great deal)

Focus	Elementary school		Middle school	
	Bench-mark grades	Other grades	Bench-mark grades	Other grades
Essential learnings and benchmarks (EALRs)	78	75	77	61
Washington student assessment (WASL)	78	67	71	53
Classroom-based assessments (e.g., Stiggins training, assessment Tool Kits)	73	71	52	50
Aligning curriculum and instruction with EALRs in mathematics	67	60	65	62
Aligning curriculum and instruction with EALRs in writing	90	81	80	67
Aligning curriculum and instruction with EALRs in reading	94	92	75	74
District assessments	52	52	36	33

Table 13

Activities Undertaken in Response to WASL (percent of principals)

Activity	Elementary school	Middle school
Convey Information About WASL		
Held staff meetings that focus on WASL issues	100	98
Held cross-grade meetings to discuss WASL test results	88	78
Had teachers or school leadership team take WASL test items	82	70
Promote Professional Development		
Encouraged teachers to obtain assessment Tool Kit training	96	88
Directed Student Learning Improvement Grant (SLIG/LIA) funds towards WASL-related activities	88	96
Motivate Students and Provide Test Preparation		
Implemented test preparation activities (e.g., Example Tests)	100	92
Appealed to teachers' and students' school pride to do well on WASL	88	96
Provided release time for teachers to prepare for WASL	67	82
Provided incentives for students related to WASL performance (e.g., parties, fieldtrips)	29	35
Change School Schedules and Other Policies		
Implemented schedule changes that increased time for math, reading, and/or writing	71	55
Extended instructional hours (e.g., created all-day kindergarten, instituted Summer school, created Saturday school)	49	42
Changed report card format	47	4
Instituted a student grade-level retention or promotion policy	27	46
Transferred teachers to different grades or subjects	16	18
Change Curriculum and Instruction		
Developed a school plan for improving performance on WASL	100	72
Instituted school wide policies to address curriculum gaps (e.g., use of Weekly Reader, "task of the week")	73	65
Created homework clubs	39	48

range of activities undertaken by schools in response to WASL. Many of these actions were designed to help students master the knowledge and skills embodied in the EALRs. Others were more narrowly focused on WASL-tested skills and may lead to improved WASL scores without accompanying improvements in students' underlying knowledge and skills. As a result, information about the actions schools have taken to improve scores is important in assessing the validity of WASL scores (i.e., the extent to they represent real improvement in student mastery of standards).

The most widespread school responses to WASL were to convey information about the tests and to promote professional development (see Table 13). Over 80% of schools organized meetings of groups of teachers and staff to share information about WASL in one form or another. Almost all schools also offered professional development opportunities that focus on WASL-related issues. Almost all schools also engaged in test preparation activities to motivate students and prepare them for taking standardized tests. Over one quarter provided explicit incentives for students to do well, including such things as parties and fieldtrips. About one half of the schools changed schedules in one way or another to increase or focus time on tested subjects. Many schools also instituted schoolwide policies to address curriculum gaps.

District assessments had a much lower profile than WASL tests for most schools. As Table 14 shows, between 50% and 70% of principals said that district test results were publicly reported (compared with almost universal public reporting of WASL and ITBS scores). District tests were used more for instructional purposes, such as referring students to special programs or grouping students for instruction, than for accountability purposes. About one third of principals reported that district tests were used as the basis for student promotion or retention. In a handful of schools, district test results also were used to evaluate teachers.

Principals held mixed opinions about the factors that affected WASL scores. Over 90% of principals believed that teachers needed to change their practices to improve student performance, and that better classroom-based assessments would lead to improved WASL scores in the future. However, about three quarters of principals believed that better test preparation was responsible for most WASL score

Table 14

Use of District Assessments (percent of principals whose districts administer additional tests)

Use of assessment	Elementary school	Middle school
Referring students to special programs (e.g., summer school after-school programs)	76	78
Grouping students for instruction	68	69
Public reporting	51	70
Student grade-level retention or promotion	37	32
School-level consequences (e.g., assistance for low performing schools)	27	32
Teacher evaluation	17	14

gains in the past (see Table 15). While most principals credited test preparation with helping to raise scores, only about 40% thought it was easy to raise WASL scores by focusing on a few specific skills. Two thirds of principals believed that the WASL tests were of appropriate difficulty, and a similar number believed differences from one cohort of students to the next made it difficult to prepare students properly. Less than one half thought that sufficient accommodations were provided for students with special needs.

It was interesting to see how responsibility for decisions related to the education reform was divided among district, school, and classroom staff (see Tables 16 and 17). According to principals, district administrators or district committees were almost always responsible for textbook selection. In more than one half of the cases they were also responsible for aligning curriculum with the EALRs. School principals and district administrators shared the responsibility for providing information to teachers about the EALRs and WASL. Decisions regarding professional development and allocating professional development resources were most often made by school leadership teams or by school principals. Classroom teachers most often retained the responsibility for developing classroom-based assessments. These patterns were similar in elementary and middle schools.

Table 15

Principals' Opinions About WASL Scores and Assessments (percent of principals who somewhat agree or strongly agree)

Statement	Elementary school	Middle school
Teachers need to change their teaching practices to support the Washington education reform	98	94
Better classroom-based assessments will lead to improved WASL scores	92	94
Better test preparation is responsible for most WASL score gains	69	82
The WASL tests are of appropriate difficulty for the tested grade levels	67	60
Differences in student characteristics from year to year make it difficult to prepare students for WASL	67	59
The WASL tests permit sufficient accommodations for students with disabilities and Limited English Proficient students	42	41
There has been little focus on classroom based assessments because scores from these assessments are not reported	35	49
It is easy to raise student WASL scores by focusing on a few specific skills	39	40

Table 16

Primary Responsibility for Decision Making: Elementary Schools (percent of principals)

Activity	District administrators, teams or committees	School administrators	School shared decision-making teams	Teachers
Selecting textbooks	88	0	10	2
Selecting other instructional materials	25	2	43	30
Developing classroom-based assessments	15	2	17	66
Planning professional development activities	36	11	50	2
Determining how professional development funds are spent	10	2	83	4
Providing information to teachers about the EALRs and WASL	43	43	13	0
Aligning curriculum with the EALRs at benchmark grades	51	4	18	27
Aligning curriculum with the EALRs at other grades	56	7	13	24
Analyzing WASL results	30	28	33	9

Table 17

Primary Responsibility for Decision Making: Middle Schools (percent of principals)

Activity	District administrators, teams or committees	School administrators	School shared decision-making teams	Teachers
Selecting textbooks	71	0	24	4
Selecting other instructional materials	36	0	20	44
Developing classroom-based assessments	29	0	22	49
Planning professional development activities	25	25	50	0
Determining how professional development funds are spent	18	9	73	
Providing information to teachers about the EALRs and WASL	37	47	14	2
Aligning curriculum with the EALRs at benchmark grades	58	5	21	16
Aligning curriculum with the EALRs at other grades	62	5	21	12
Analyzing WASL results	32	34	27	7

Results: Elementary and Middle School Teachers

Approximately two thirds of the teachers understood the EALRs, WASL and how to align curriculum with the EALRs, but less than one half reported that they understood classroom-based assessments. Furthermore, about two thirds of teachers believed the broad goals of the reform were attainable and the standards were appropriate.

Most teachers reported that their curriculum was aligned with the EALRs in the subjects that were tested by the state, but the degree of alignment was lower in subjects that were not tested. Three quarters of the teachers who use textbooks to teach writing and mathematics indicated that these materials were aligned with the EALRs, as well.

Most teachers thought the education reform promoted better instruction and increased student learning, but some components of the reform were more influential than others. Two thirds of the teachers said the EALRs and the WASL short-answer and extended-response items had a positive impact, whereas one half or fewer said classroom-based assessments, district assessments or the WASL multiple-choice items were influential. Locally administered professional development was one of the most important influences on the teaching of writing and mathematics. On average, teachers participated in about three days of professional development each year, and about one half of this was related directly to the Washington education reform. In addition, many teachers served on school or district committees responsible for implementing parts of the reform. However, this professional development focused on subjects that were tested as part of WASL far more than other subjects addressed in the EALRs.

As a result of these influences, teachers made changes to curriculum and instruction. Elementary school teachers increased the time they spend on WASL-tested subjects and decreased the time they spend on aspects of the standards that were not tested. Writing teachers in the fourth and seventh grades emphasized writing conventions and the writing process, which were important parts of writing instruction in many districts prior to the education reform. However, most teachers also increased their emphasis on using a writing style appropriate to the audience and the purpose and on writing for different purposes, which are the elements of writing promoted by the EALRs. Both fourth-grade teachers and seventh-grade teachers asked students to write on a daily or weekly basis, but most student writing

consisted of short pieces of one to two paragraphs. Over the last two years, some teachers increased the number of writing assignments they gave; most often they increased the shorter pieces. More fourth-grade teachers than seventh-grade teachers increased the number of writing assignments. Teachers also made some changes in their teaching methods, incorporating more rubric-based approaches to writing.

Three quarters of the mathematics teachers emphasized number sense on a weekly or daily basis, which was much more than any other content area. However, in response to the reform, almost one half of the teachers increased the emphasis they gave to probability and statistics. Most teachers emphasized most of the mathematical processes that are delineated in the EALRs, and they increased their emphasis on analyzing information, investigating situations, representing and sharing information, and drawing conclusions and verifying results. Elementary school teachers reported greater changes in mathematics curriculum than middle school teachers. While mathematics teaching methods did not change much, the majority of teachers said they increased the frequency of open-response questions with many right answers. Students also were asked more frequently to write about mathematics, to explain their thinking to other students, and to represent things in graphs.

Teachers had mixed opinions about the WASL and WASL scores. Many thought the test was not of appropriate difficulty. Many also thought test score changes were due primarily to test preparation activities and changes in the students from year to year. Nevertheless, teachers have taken many steps to improve WASL scores. These include activities designed to promote mastery of elements of the EALRs as well as activities that focus more narrowly on the format and content of the test.

Teachers' Understanding of Education Reform

The majority of teachers reported that they understood the EALRs, WASL and curriculum alignment either well or very well, but less than one half reported similar levels of understanding about classroom-based assessments. As Table 18 shows, 80% or more of the teachers thought they understood the WASL well, and 60% or more indicated they understood the EALRs and curriculum alignment. Despite the fact that the EALRs were developed and circulated first, WASL appears to have garnered more of teachers' attention. Fourth-grade teachers were somewhat

Table 18

Teachers' Understanding of Education Reform (percent of teacher who understand well or very well)

Aspect of reform	Fourth-grade teachers	Seventh-grade writing teachers	Seventh-grade mathematics teachers
Washington student assessment (WASL)	94	80	84
Essential learnings and benchmarks (EALRs)	86	76	68
Aligning curriculum and instruction with EALRs	78	68	63
Classroom-based assessments (e.g., Stiggins training, assessment Tool Kits)	55	43	41

more familiar with the reform than seventh-grade teachers, as might be expected since elementary teachers have had one more year of exposure to the WASL.

Fewer teachers reported that they understood classroom-based assessment well. The percentage of teachers who understood classroom-based assessment was 20 to 25 points lower than the percentage who understood the other aspects of the reform. This pattern was consistent with the relative emphasis that classroom-based assessment received in teachers' professional development (see below).

Teachers endorsed the broad goals of the reform and way they were operationalized in the standards. As Table 19 shows, more than one half of the teachers believed the goals of the reform were attainable and believed the standards set by the EALRs were appropriate for the benchmark grade levels. However, a sizable minority of teachers—more than one third—disagreed. Fourth-grade teachers who had the most exposure to the WASL tests were the most cautious. Only 60% thought the EALRs were appropriate for fourth grade, and only one half

Table 19

Teachers' Opinions About Reform Goals (percent of teachers who somewhat agree or strongly agree)

Aspect of reform	Fourth-grade teachers	Seventh-grade writing teachers	Seventh-grade mathematics teachers
The EALRs are appropriate for the benchmark grade levels (Grades 4, 7 and 10)	61	67	64
The goals of Washington's education reform are attainable (e.g., all students will be able to think analytically, logically and creatively)	51	66	44

thought the goals were attainable. Seventh-grade mathematics teachers were also very concerned with the goals of reform; fewer than one half believed the goals were attainable.

Teachers had access to many sources of information about the education reform, but most teachers learned about the reform, at least in part, through formal professional development. Teachers participated in a substantial amount of professional development in the last two school years (1997-98 and 1998-99). The median number of hours of professional development during these two years was 50 hours, approximately three full days each school year. Approximately one half of this training was related directly to the Washington education reform (50% for fourth-grade teachers and seventh-grade math teachers, 44% for seventh-grade writing teachers).

In addition, many teachers served on district or school committees responsible for planning or implementing educational reform.[6] Table 20 shows that about one half or more of the teachers were involved in school-level committees and about one quarter or more were involved in district-level committees. The greatest percentage of teachers served on committees devoted to classroom-based assessments. Many teachers also served on local committees working on aligning curriculum and instruction with the EALRs and developing WASL-related materials. A much smaller percentage teachers were involved with committees working directly on

Table 20

Teacher Service on Committees Related to Education Reform (percent of teachers reporting participation)

Committee	Fourth-grade teachers		Seventh-grade writing teachers		Seventh-grade mathematics teachers	
	District	School	District	School	District	School
Preparing materials related to classroom-based assessment	16	69	16	56	22	53
Aligning curriculum and instruction with EALRs	37	52	26	51	31	60
Developing EALRs or related materials	28	37	24	33	27	46
Developing WASL or related materials	8	39	5	30	14	30
Developing accountability system	7	34	8	28	8	27

[6] Only a few teachers in our sample served on committees at the state level.

accountability. This is to be expected since the accountability provisions of the state reform were still under development. The percentage of fourth-grade teachers who served on committees at either level was higher than the percentage of seventh-grade mathematics teachers or seventh-grade writing teachers. This is may be related to the earlier administration of the WASL in fourth grade.

Alignment of Standards and Curriculum

Most teachers reported that their curriculum and their instructional materials were *somewhat well aligned* or *very well aligned* with the EALRs. Figure 6 shows teachers' responses to questions about alignment in all the subjects for which there are EALRs. About one quarter of fourth-grade teachers and seventh-grade writing teachers indicated that their writing curriculum was aligned with the EALRs. A slightly lower percentage of teachers found their mathematics curriculum to be aligned with the EALRs.

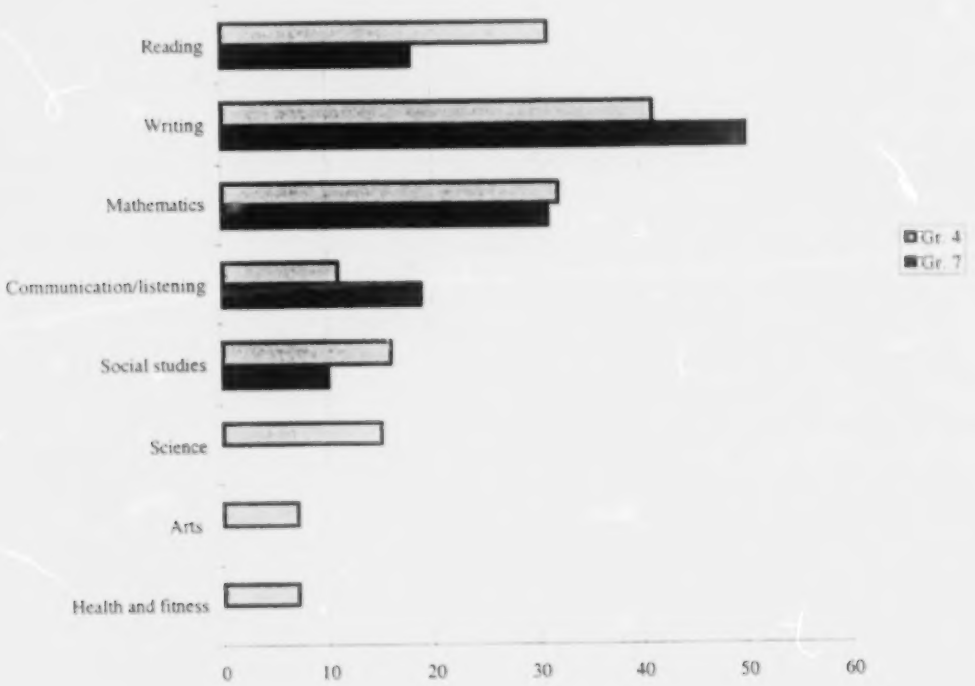

Figure 6. Alignment of curriculum with EALRs (percent of those who teach subject reporting very well aligned).

Teachers also reported that their instructional materials were well aligned with the EALRs. In writing, slightly more than one half of the fourth-grade teachers (55%) and about three quarters (74%) of the seventh-grade writing teachers indicated that they used a writing or language arts textbook. Approximately one quarter of these teachers indicated that their writing textbook was very well aligned with the EALRs. A similar degree of alignment was reported for mathematics materials. Almost all fourth-grade teachers (93%) and the seventh-grade mathematics teachers (89%) used a mathematics textbook. Of these, 16% indicated that their textbook was very well aligned with the EALRs in mathematics.

Almost all teachers believed they understood the content they needed to know to prepare students to succeed on WASL. Eighty percent of fourth-grade teachers, 87% of seventh-grade writing teachers and 88% of seventh-grade mathematics teachers agreed or strongly agreed that they had adequate knowledge of content to meet the demands of WASL.

Influence of Reform Elements

Most teachers felt that reforms promoted better instruction and increased student learning; however, teachers found some aspects of the reform more influential than others (see Table 21). For example, about two thirds of teachers said the EALRs and the WASL short-answer and extended-response items contributed to better instruction and increased student learning. Seventh-grade writing teachers gave particularly high ratings to WASL extended-response and short-answer items. The percent of teachers who said those elements promoted better instruction *a great deal* was over 40% for WASL extended-response and over 25% for WASL short-answer items. Fewer teachers believed that the WASL multiple-choice items, classroom-based assessments or district assessments promoted improved teaching and learning. In particular, less than one third of the seventh-grade mathematics teachers thought that WASL multiple-choice items or classroom-based assessments promoted better instruction.

Two thirds of the teachers said they needed to change their teaching practices to support the education reform (see Table 22). They also said the reforms reinforced the changes they were already in the process of making.

Teachers responded differently to various elements of the Washington education reform. Table 23 illustrates the relative impact of aspects of the Washington education reform on the content and teaching of writing. The state-

Table 21

Degree to Which Reform Elements Promoted Better Instruction and Increased Student Learning (percent of teachers reporting a moderate amount or a great deal)

Aspect of reform	Fourth-grade teachers	Seventh-grade writing teachers	Seventh-grade mathematics teachers
EALRs	68	68	50
WASL short-answer items	68	67	61
WASL extended-response items	67	72	70
WASL multiple-choice items	50	44	32
Classroom-based assessments (e.g., Stiggins training, assessment Tool Kits)	53	43	29
District assessments	41	55	28

Table 22

Opinions About Education Reform (percent of teachers who somewhat agree or strongly agree)

Aspect of reform	Fourth-grade teachers	Seventh-grade writing teachers	Seventh-grade mathematics teachers
Washington's education reform encourages me to make the changes that I was already in the process of making	68	79	62
I need to change my teaching practices to support Washington's education reform	67	61	63

Table 23

Influences on Writing Lessons and Instruction (percent of teachers indicating a moderate amount or a great deal)

Aspect of Washington education reform	Grade 4	Grade 7
WASL	75	76
In-service training or formal professional development on methods of teaching writing	66	66
Scores on WASL tests	64	73
Classroom-based assessments	65	60
EALRs	64	66
District standards	53	56
District assessments	45	53

administered WASL test and the WASL scores appeared to be the most influential factors. About three quarters of writing teachers in both grade levels reported that WASL had a moderate or a great deal of influence on changes in their writing instruction. A similar proportion said that their schools' WASL scores contributed to making changes in their writing programs. In fact, all the state-administered aspects of the Washington education reform (including WASL, EALRs, and classroom-based assessments) had a moderate amount of influence for more than one half of the teachers.

Locally administered professional development was one of the most important influences on teachers' responses to the Washington education reform. Two thirds of writing teachers in both grade levels said professional development had a moderate or great deal of influence on their writing instruction. However, district-level reforms were somewhat less influential. About one half of the teachers said their district standards and their locally administered district assessments influenced their writing teaching. This result is consistent with the lower frequency of district writing tests. Only about 40% of teachers (35% of fourth-grade teachers and 44% of seventh-grade writing teachers) reported that their district administered its own assessment of writing at their grade level.

In comparison, most mathematics teachers indicated that WASL extended-response items had the greatest impact on their teaching, followed by the WASL short-answer items and WASL scores (see Table 24). Multiple-choice items on the WASL were the least influential of the state and district reforms. Fewer than one half of teachers found WASL multiple-choice items to have moderate or great influence. Seventy-one percent of the fourth-grade teachers regarded the EALRs as at least moderately influential, but barely one half of the seventh-grade teachers regarded the EALRs as influential.

As with writing, locally administered professional development in mathematics had a moderate or a great deal of influence for nearly two thirds of the teachers. Fewer teachers found district-level reforms to be influential. Although more than half of teachers reported that district standards influenced their mathematics curriculum and instruction, only about 40% indicated that district assessments were at least moderately influential. Only 42% of fourth-grade teachers and 46% of seventh-grade teachers reported that their district administered its own tests in mathematics.

Table 24

Influences on Mathematics Lessons and Instruction (percent of teachers indicating a moderate amount or a great deal)

Aspect of Washington education reform	Grade 4	Grade 7
WASL extended-response items	86	85
WASL short-answer items	76	76
Scores on WASL tests	75	71
EALRs	71	52
Classroom-based assessments	69	58
In-service training or formal professional development on methods of teaching writing	62	64
District standards	60	61
WASL multiple-choice items	45	41
District assessments	45	38

Actions in Response to Education Reform

Teachers responded to the reform in a variety of ways, including participating in focused professional development. Overall, about one half of the teachers agreed that the education reform led to valuable professional development opportunities. Seventh-grade writing teachers were most positive in this regard. Sixty-four percent of seventh-grade writing teachers credited the reform with creating new professional development opportunities compared to 46% of fourth-grade teachers and 50% of seventh-grade mathematics teachers.

In terms of content areas, most of the professional development that teachers participated in focused on the subjects tested on WASL or on the state norm-referenced test, that is, mathematics, writing and reading (see Table 25). Fewer than one quarter of the teachers participated in professional development that emphasized social studies, science, arts, or health and fitness. Listening is the only tested subject that was not a major focus of teachers' professional development. Conversations with Washington educators suggest this may have been due to the brevity of the WASL listening test and to early indications that students were mastering the listening requirements.

In general, teachers were satisfied with the quality of their content area professional development. In fact, a sizable percentage of teachers—about one third—rated the training they received in WASL-tested subjects as excellent (see

Table 25

Emphasis of Professional Development on Content Areas (percent of teachers reporting a moderate amount or a great deal of emphasis)

Content areas	Fourth-grade teachers	Seventh-grade writing teachers	Seventh-grade mathematics teachers
Reading	79	60	40
Writing	81	73	48
Mathematics	68	9	72
Communication/listening	12	31	20
Social studies	5	13	5
Science	16	4	15
Arts	8	2	0
Health and fitness	2	0	2

Table 26). The majority of teachers (between 51% and 73%) rated the quality of the training in every subject as average.

Teachers also reported on their participation in professional development that focused on the elements of the educational reform—assessments and curriculum alignment (see Table 27). Approximately one half of the teachers reported that their

Table 26

Quality of Professional Development in Content Areas (percent of teachers reporting excellent)

Content areas	Fourth-grade teachers	Seventh-grade writing teachers	Seventh-grade mathematics teachers
Reading	23	46	23
Writing	33	39	18
Mathematics	33	—	31
Communication/listening	—	15	7
Social studies	—	—	—
Science	—	—	—
Arts	—	—	—
Health and fitness	—	—	—

Note. Quality ratings for a subject were omitted when fewer than 20% of the teachers participated in professional development that emphasized that subject.

Table 27

Emphasis of Professional Development on Reform Components (percent of teachers reporting a moderate or a great deal of emphasis)

Topic	Fourth-grade teachers	Seventh-grade writing teachers	Seventh-grade mathematics teachers
WASL in reading	47	56	32
WASL in writing	53	66	50
WASL in mathematics	46	12	60
WASL in listening	11	27	12
Classroom-based assessments	31	32	20
District assessments	27	37	32
Aligning curriculum and instruction with EARLs	42	47	61

professional development activities focused either a moderate amount or a great deal on WASL in the subject(s) they teach. Almost as many reported a moderate or strong professional development focus on aligning curriculum and instruction with the EALRs. A much lower percentage of the teachers (between one quarter and one third) participated in professional development that emphasized district assessments or classroom-based assessments.

The majority of teachers rated professional development related to assessments and curriculum alignment as average (50% to 80%). Table 28 shows the percentage of teachers who rated each type of professional development as excellent. Seventh-grade writing teachers were much more satisfied with professional development related to the WASL in reading and writing than any other teachers or any other subjects. In fact, a sizable minority of seventh-grade mathematics teachers (38%) rated professional development regarding classroom-based assessment as poor.

Use of instructional time. Among fourth-grade teachers who teach all subjects, the allocation of instructional time appeared to be influenced by the state testing program more than the state standards. Figure 7 shows that teachers spent a majority of their instructional time—63%—on the tested subject areas of reading, mathematics and writing. The median total number of hours per week devoted to all subjects was 25 hours. Among the non-tested subjects, social studies received the most attention, with one half of fourth-grade teachers spending at least three hours each week on social studies. Other subjects received less attention: One half of

Table 28

Quality of Professional Development on Assessment and Alignment (percent of teachers reporting excellent)

Topic	Fourth-grade teachers	Seventh-grade writing teachers	Seventh-grade mathematics teachers
WASL in reading	13	43	15
WASL in writing	18	45	15
WASL in mathematics	13	—	27
WASL in listening	—	9	—
Classroom-based assessments	12	25	17
District assessments	9	8	13
Aligning curriculum and instruction with EARLs	12	18	11

Note. Quality ratings were omitted when fewer than 20% of the teachers participated in professional development that emphasized that subject.

fourth-grade teachers spent no more than two hours on science each week, and one half of fourth-grade teachers spent less than one hour each week on arts and health and fitness. This occurred despite the fact that there are state standards in these subjects and teachers reported that they had access to curriculum.[7]

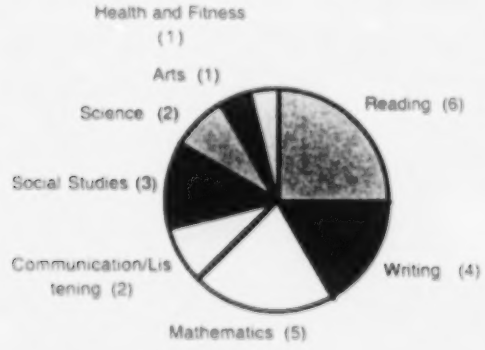

Figure 7. Instructional emphases across subjects (percent of instructional time allocated to each subject; median hours per subject in parentheses).

[7] More than 90% of fourth-grade teachers reported having adequate curriculum for all subjects.

Changes in instructional emphasis. Teachers increased the time they spent on tested subjects during the past two years, while decreasing the time they spent on the non-tested subjects (see Figure 8). Although about one quarter of the teachers increased the time they spent on communications/listening, the total amount of instructional time devoted to this subject is still relatively low.

Impact on writing content, teaching strategies, and activities. Most writing teachers in the fourth and seventh grades reported that they changed the overall content of their writing lessons and their teaching methods over the last two years. At fourth grade, 42% of teachers changed their writing pedagogy and content a great deal, and 81% of teachers reported making at least a moderate amount of change. Fewer seventh-grade writing teachers made changes: 29% reported a great deal of change and 55% reported at least a moderate amount of change.

The content of the writing curriculum is broadly reflective of the EALRs in both the fourth and seventh grades. Eleven of the 14 writing behaviors specified in the EALRs are covered weekly or more often by over 40% of the teachers in both grade levels (see Figure 9). However, teachers concentrated classroom time more on writing conventions and on the writing process than on the other elements of the EALRs. Over 80% of teachers in both grades addressed the application of writing conventions at least weekly. All the elements of the writing process except

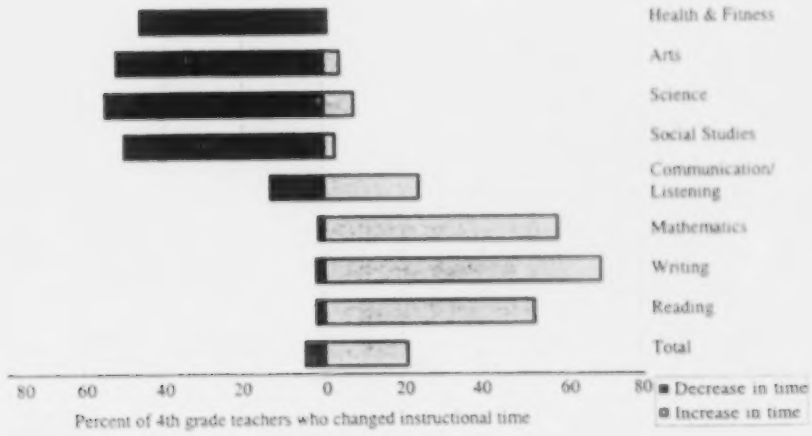

Figure 8. Change in instructional emphases across subjects (percent of teachers indicating change).

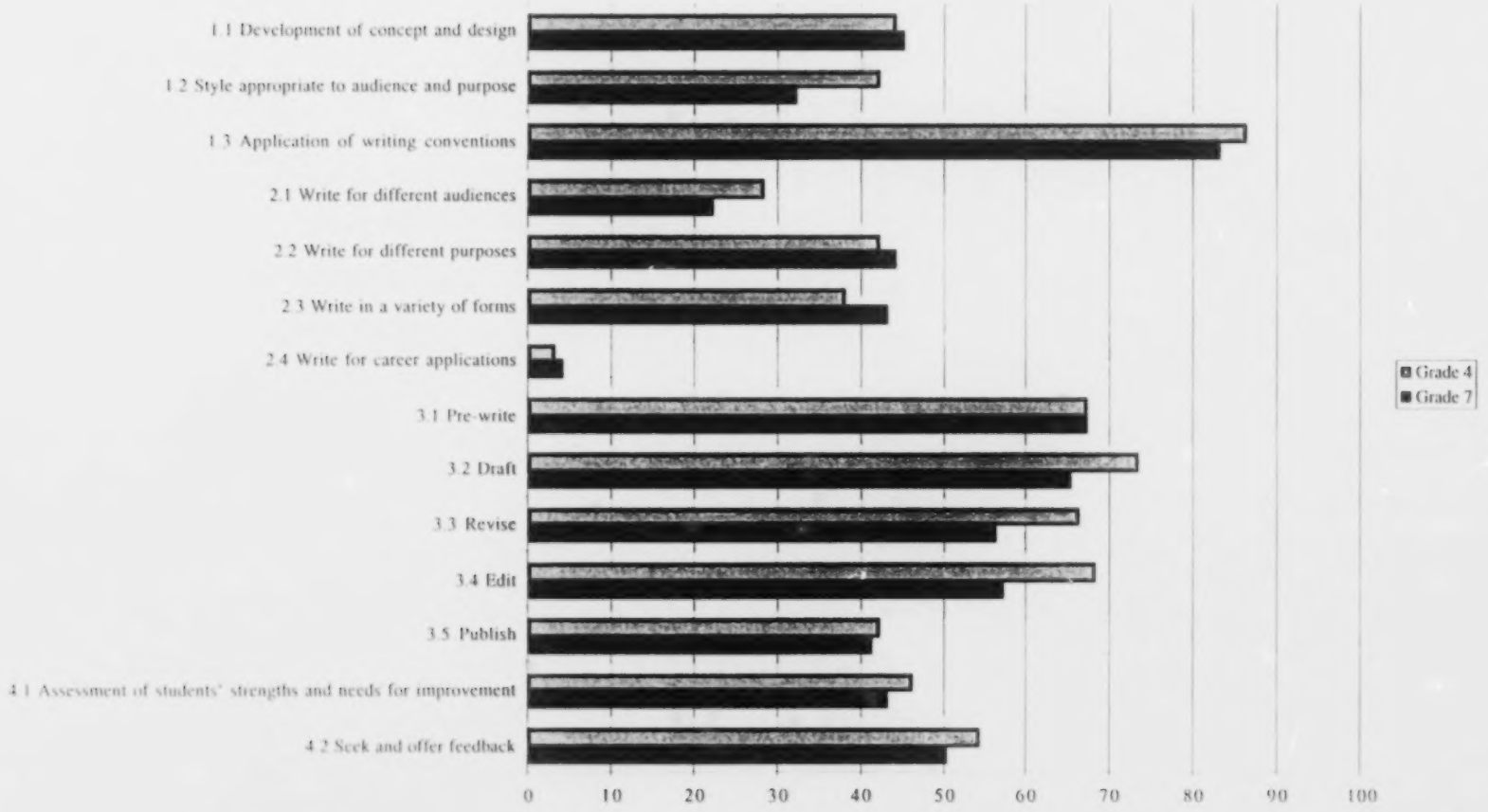

Figure 9. Frequency of coverage of writing EALRs (percent of teachers covering aspect weekly or daily).

publishing (i.e., pre-write, draft, revise, edit publish) were covered at least weekly by more than two thirds of the fourth-grade teachers and more than one half of the seventh-grade writing teachers. Teachers in both grade levels focused less often on writing for different purposes, different audiences, writing in different forms, and writing for career applications, which are the less traditional aspects of the writing EALRs. Thus, the writing content most frequently taught might be considered more "traditional," and the content taught less frequently might be considered more "reform-oriented."

Teachers also reported that they were changing their emphasis on writing topics, and the greatest increases in coverage were for the less traditional topics (see Figure 10). Roughly one half of the teachers in both grade levels reported increasing their coverage of different audiences, purposes, and forms of writing, as well as the application of styles appropriate to different audiences and purposes. These are the elements of writing emphasized by the WASL. About one third increased coverage of the most frequently covered EALRs, suggesting that teachers' emphasis on writing conventions and the writing process preceded the reform.

Teachers were also changing the methods they used to teach writing. Teachers reported the frequency with which they used 15 different instructional strategies ranging from fairly traditional techniques (e.g., "read orally to students") to more innovative approaches (e.g., "write with students on the same assignment"; see Figure 11). Most teachers in both grades read to students at least once a week and taught language mechanics (grammar, spelling, punctuation and syntax) as frequently. More than one half of the teachers taught about word choice and helped students revise their work on a weekly or daily basis.

Some teaching strategies were not used frequently by many teachers. Few teachers in either grade regularly used WASL rubrics to comment on student writing, held conferences with students about their writing, or wrote along with students on the same assignment. More than 10% of teachers never wrote with students on the same assignment.

More fourth-grade teachers were likely to read orally to students on a daily or weekly basis than were seventh-grade teachers. Fourth-grade teachers were also more likely to use rubric-based approaches to writing frequently; over 60% of fourth-grade teachers taught "Six Trait" or other rubric-based approaches to writing at least weekly compared to about 40% of seventh-grade writing teachers. Regular

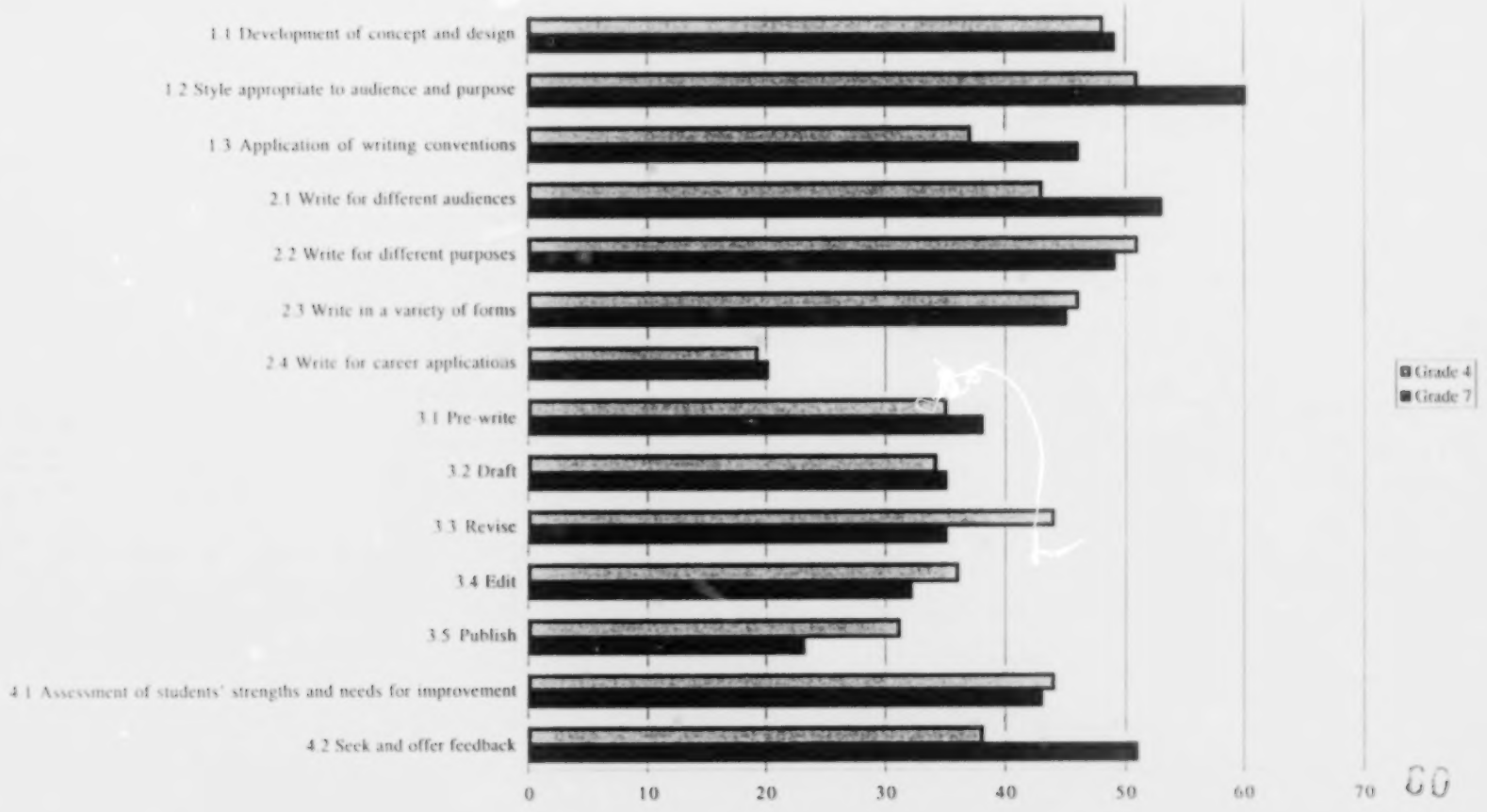

Figure 10. Increase in frequency of coverage of writing EALRs (percent of teachers indicating an increase).

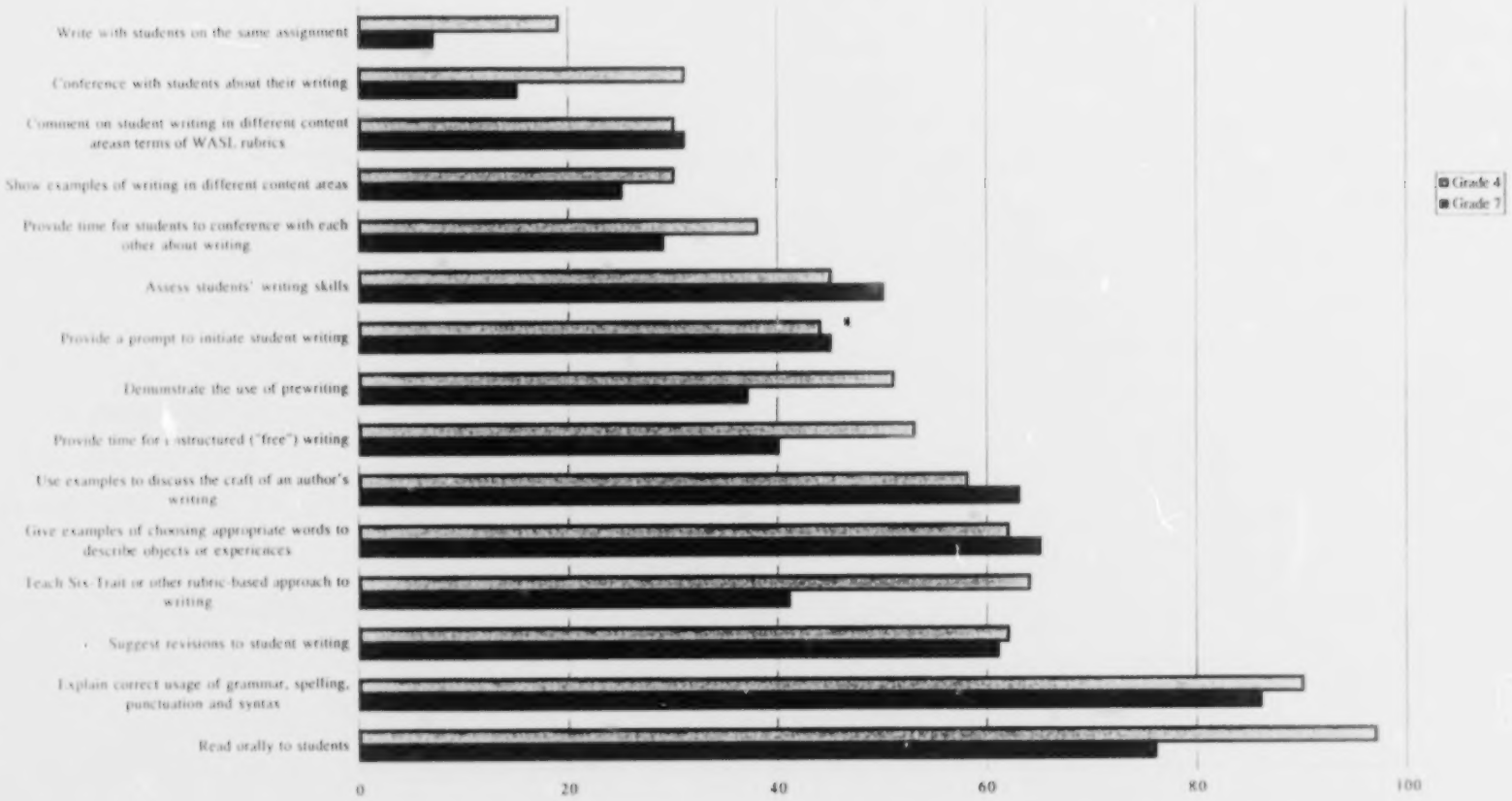
Write with students on the same assignment
Conference with students about their writing
Comment on student writing in different content areasn terms of WASL rubrics
Show examples of writing in different content areas
Provide time for students to conference with each other about writing
Assess students' writing skills
Provide a prompt to initiate student writing
Demonstrate the use of prewriting
Provide time for unstructured ("free") writing
Use examples to discuss the craft of an author's writing
Give examples of choosing appropriate words to describe objects or experiences
Teach Six-Trait or other rubric-based approach to writing
Suggest revisions to student writing
Explain correct usage of grammar, spelling, punctuation and syntax
Read orally to students
0
20
40
60
80
100
Grade 4
Grade 7

Figure 11. Frequency of use of selected teaching strategies in writing (percent of teachers using strategy weekly or daily).

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time for unstructured "free" writing and for pre-writing activities was also somewhat more common among fourth-grade than seventh-grade teachers.

The greatest changes in writing instruction were related to the use of rubrics: teaching Six Trait or other rubric-based approaches and commenting on student writing in terms of WASL rubrics. As Figure 12 shows, the majority of teachers in both grade levels increased their use of these two strategies for teaching writing. One quarter to one third of the teachers reported increasing their use of many of the other strategies as well. A handful of teachers decreased the time they devoted to unstructured, "free" writing: 19% of fourth-grade teachers and 15% of seventh-grade writing teachers. For most of the teaching techniques in the survey the degree of change was similar among fourth-grade teachers and seventh-grade writing teachers. The one exception was explaining mechanics and reading orally to students; more seventh-grade teachers than fourth-grade teachers increased the frequency of reading orally to students. Overall, more teachers reported changing how writing was taught (i.e., strategy) than what was taught (i.e., content).

Writing teachers gave students regular writing assignments, but most of the writing assignments were short pieces, one to two paragraphs in length. Eighty-five percent of fourth-grade teachers and 91% of seventh-grade writing teachers reported that their students produced these short written works on a weekly or daily basis. Sixty-three percent of teachers indicated that students produced mid-length pieces (one to two pages length) only once or twice a month. Over one half of the teachers indicated that students wrote long pieces (three or more pages in length) only once or twice a semester. The length of the written work increased as students grew older. Fourth-grade students were asked to write shorter pieces (one to two paragraphs) slightly more frequently than seventh-grade students, but seventh-grade students were asked to write longer pieces (three or more pages) more often than fourth-grade students.

The amount of written work increased during the past two years, but most of the increase was in the form of short pieces. More teachers in both grade levels increased the frequency of short written work than increased the frequency of longer written work. For example, 45% of fourth-grade teachers increased the frequency with which students wrote short pieces (one to two paragraphs in length) compared to 35% who increased the frequency of mid-length pieces (one to two pages), and only 20% who increased the frequency of long written work (three pages or longer).

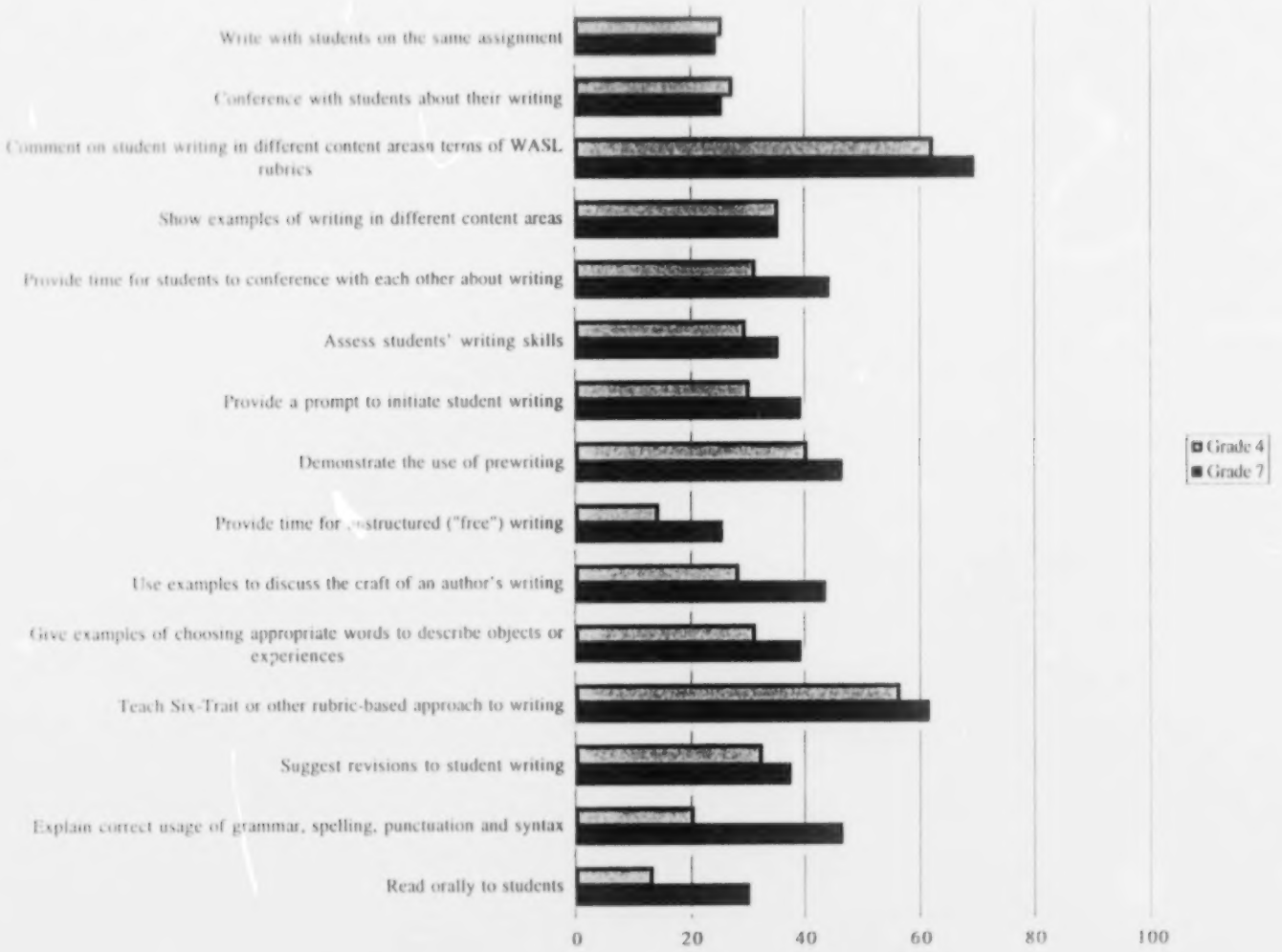
Write with students on the same assignment
Conference with students about their writing
Comment on student writing in different content areasn terms of WASL rubrics
Show examples of writing in different content areas
Provide time for students to conference with each other about writing
Assess students' writing skills
Provide a prompt to initiate student writing
Demonstrate the use of prewriting
Provide time for unstructured ("free") writing
Use examples to discuss the craft of an author's writing
Give examples of choosing appropriate words to describe objects or experiences
Teach Six-Trait or other rubric-based approach to writing
Suggest revisions to student writing
Explain correct usage of grammar, spelling, punctuation and syntax
Read orally to students
0
20
40
60
80
100
Grade 4
Grade 7

Figure 12. Increase in use of selected teaching strategies in writing (percent of teachers indicating an increase).

The percentage of seventh-grade teachers who increased the frequency of student written work was about 5 points lower than the percentage of fourth-grade teachers in each category.

Impact on mathematics content, teaching strategies, and activities. Washington mathematics teachers have changed the content of their lessons and the way they teach mathematics during the past two years. At fourth grade, 44% of teachers changed their content and pedagogy a great deal, and 84% of teachers reported at least a moderate amount of change. There was not as much change among seventh-grade mathematics teachers; only 13% of teachers reported a great deal of change and about two thirds of reported at least a moderate amount of change.

Of the five major content areas of mathematics, number sense was covered at least weekly by the greatest number of teachers (see Figure 13). Probability and statistics is the topic covered weekly by the fewest number of teachers; fewer than 20% of teachers discuss this topic at least weekly.

Furthermore, as Figure 14 shows, content emphasis has not changed dramatically in the past two years. With one exception, only about one third of the teachers reported increasing coverage of any of the five topics. In contrast, about one half of the mathematics teachers increased their coverage of probability and statistics during the past two years. More fourth-grade than seventh-grade teachers increased

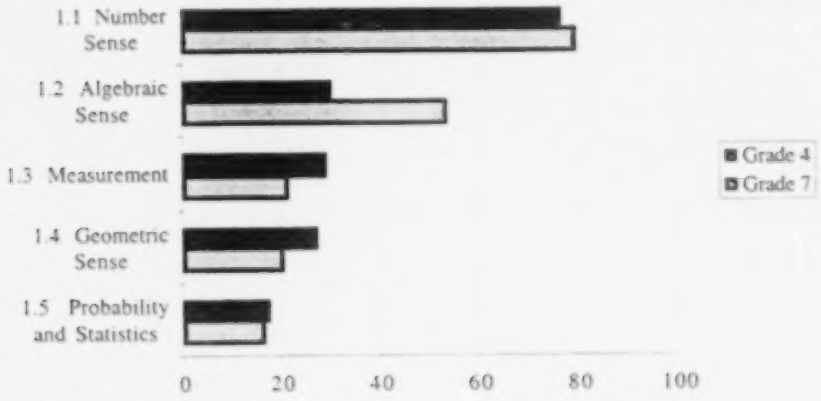

Figure 13. Frequency of coverage of mathematics content areas (percent of teachers covering content weekly or daily).

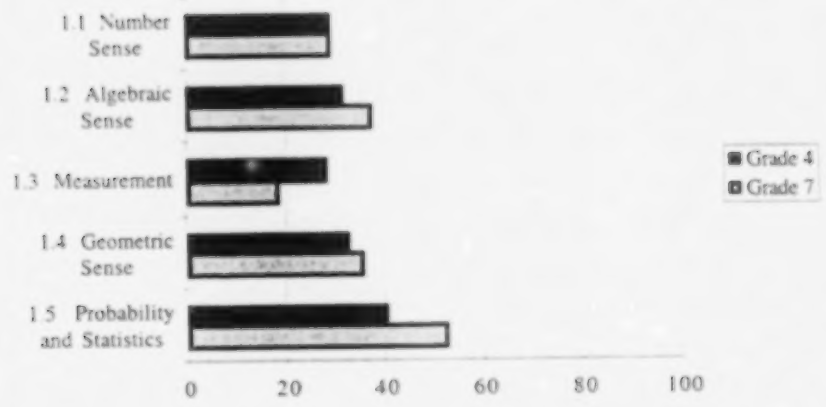

Figure 14. Increase in coverage of mathematics content areas (percent of teachers indicating an increase).

their coverage of measurement topics, whereas more seventh-grade teachers than fourth-grade teachers increased their coverage of probability and statistics.

The situation was somewhat different for mathematical processes. Most teachers covered a large number of the mathematical processes highlighted in the EALRs on a weekly or daily basis (see Figure 15). Two thirds or more of the mathematics teachers included analyzing information, constructing solutions, relating concepts to real life, and relating concepts within mathematics in their lessons on a weekly or daily basis. More fourth-grade teachers than seventh-grade mathematics teachers covered these mathematical processes at least weekly.

Teachers also reported a substantial increase in the frequency with which they addressed these mathematical processes, particularly fourth-grade teachers (see Figure 16). More than one half of the fourth-grade teachers reported increasing the frequency with which they covered most of the processes. In seventh grade, more than one half of the teachers increased the frequency of drawing conclusions and verifying results, investigating solutions, organizing and interpreting information, and representing and sharing information. These elements characterize a more problem-oriented approach to mathematics.

Most mathematics teachers regularly used a wide range of instructional strategies. Figure 17 shows that most mathematics teachers in Grades 4 and 7 regularly used strategies ranging from fairly traditional techniques (e.g., "explain new concept") to more innovative approaches (e.g., "ask open-response questions

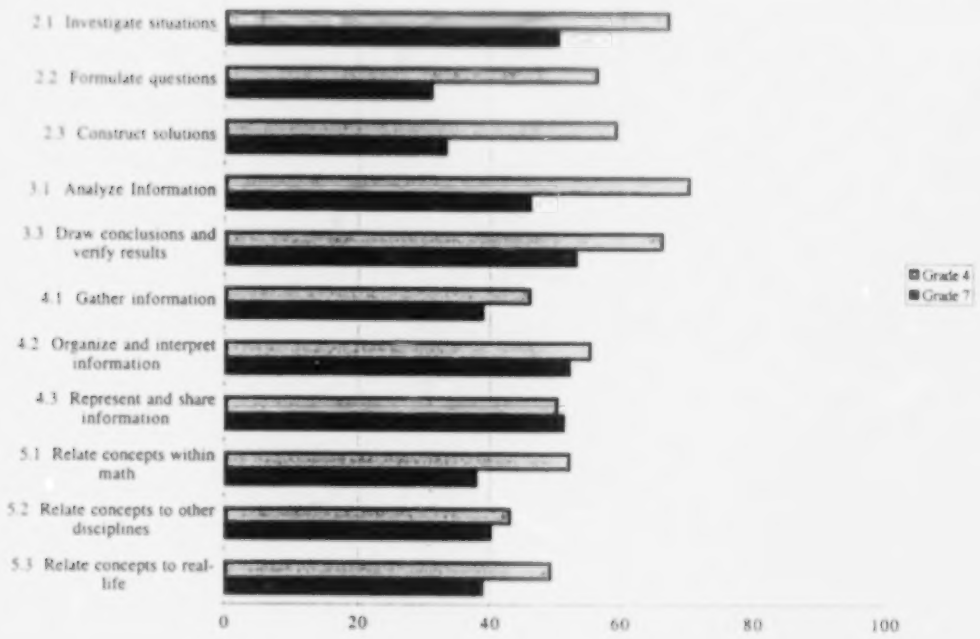

Figure 15. Frequency of coverage of mathematical processes (percent of teachers covering process weekly or daily).

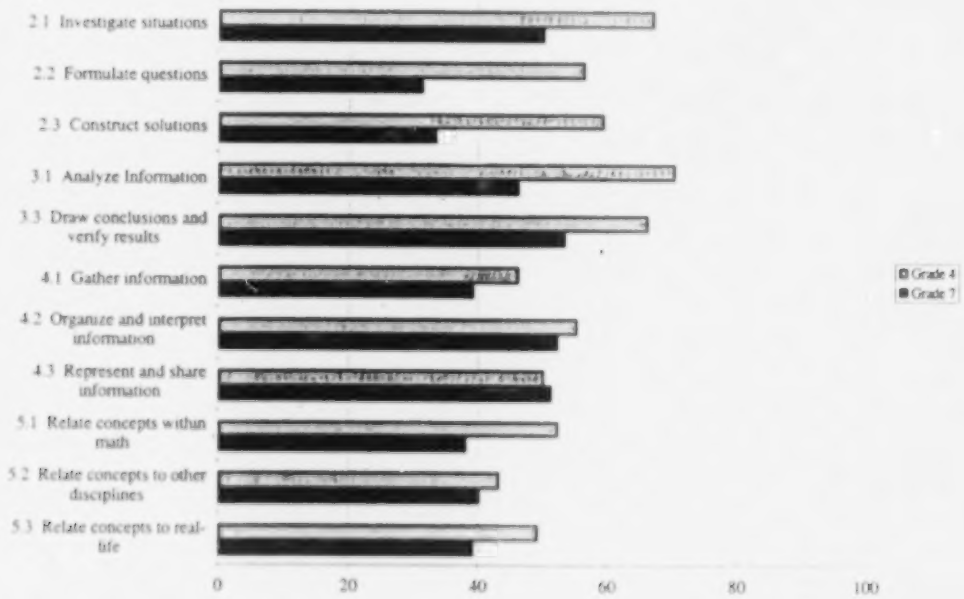

Figure 16. Increase in coverage of mathematical processes (percent of teachers indicating an increase).

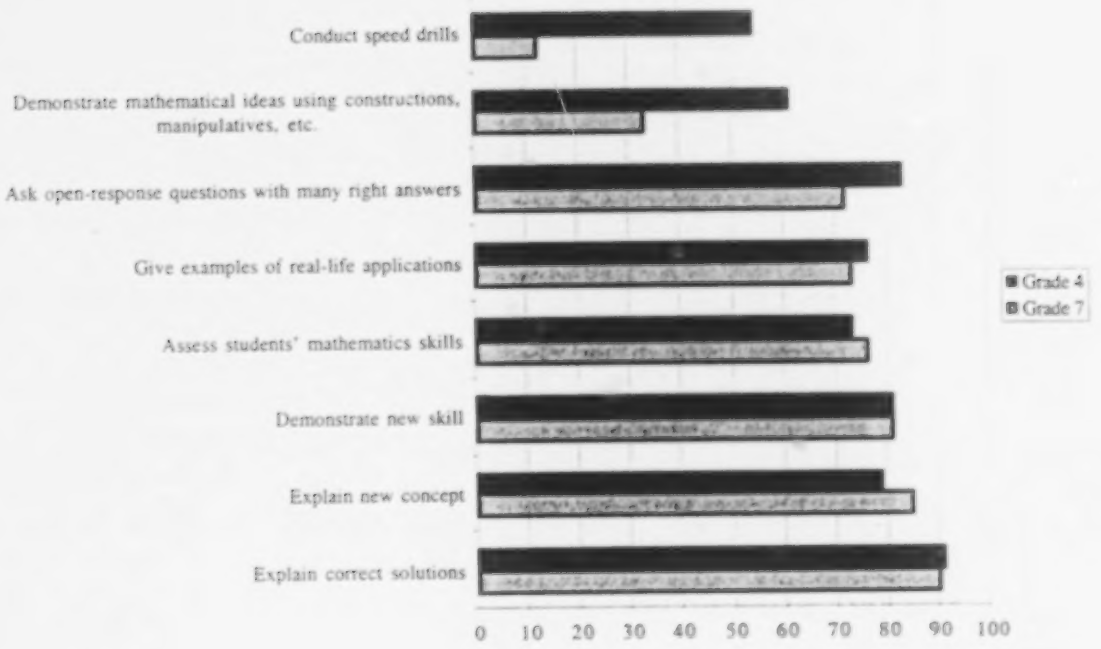
Conduct speed drills
Demonstrate mathematical ideas using constructions, manipulatives, etc.
Ask open-response questions with many right answers
Give examples of real-life applications
Assess students' mathematics skills
Demonstrate new skill
Explain new concept
Explain correct solutions
Grade 4
Grade 7
0 10 20 30 40 50 60 70 80 90 100

Figure 17. Frequency of use of selected teaching strategies in mathematics (percent of teachers using strategy weekly or daily).

with many right answers"). Fourth-grade teachers were much more likely than seventh-grade mathematics teachers to demonstrate mathematical ideas using constructions and manipulatives and to conduct speed drills in their classrooms. Only 12% of seventh-grade mathematics teachers used speed drills regularly, and some teachers, including 29% of seventh-grade teachers, never used speed drills.

With the exception of asking open-response questions with many right answers, most mathematics teachers did not increase the frequency with which they used different strategies during the last two years. However, two thirds of fourth-grade teachers and more than one half of seventh-grade mathematics teachers reported that they asked more open-response questions with many right answers. Also, nearly one half of the mathematics teachers increased the frequency of giving examples of real-life applications over the last two years. Such questions more closely resemble the WASL extended-response items and the less traditional elements of the EALRs. It is worth noting that about 20% of teachers decreased their use of speed drills during the past two years, which is greater than the percentage who increased their use of speed drills.

Some of the changes mathematics teachers made in their use of teaching strategies differed by grade level. More fourth-grade than seventh-grade teachers had students demonstrate their mathematics skill using manipulatives, had students explain correct solutions, and assessed students' mathematics skills. Seventh-grade teachers, on the other hand, increased the amount of time they spent explaining new concepts.

There was also considerable variation in the classroom activities students were asked to perform. Almost all teachers had students practice computation on a daily or weekly basis (see Figure 18). However, most teachers also had students regularly engage in less traditional activities. For example, most fourth-grade teachers had students work on problem solving in groups with other students, explain their thinking to other students, and write about mathematics at least once a week. Most seventh-grade teachers asked students to use mathematics to solve real-life problems, to learn mathematics facts, rules, and formulas, and to write about mathematics at least weekly.

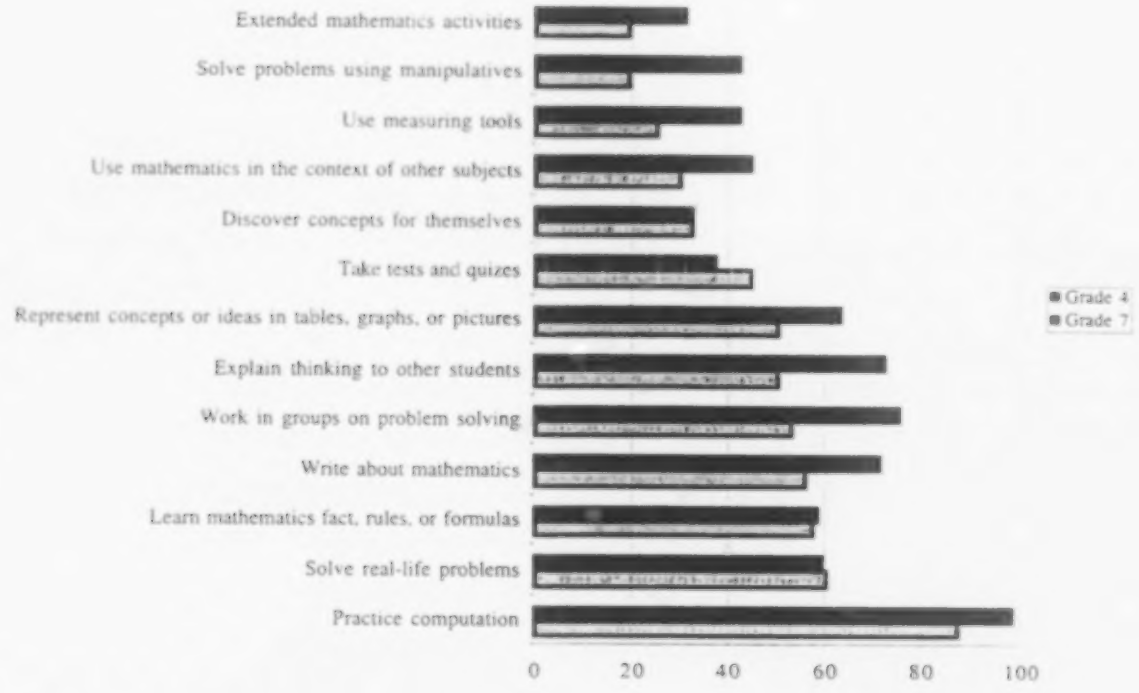

Figure 18. Frequency of selected student learning activities in mathematics (percent of teachers having students engage in activity weekly or daily).

The mathematics lessons students engage in have changed over the last two years, as well. As Figure 19 shows, writing about mathematics was the activity whose frequency was increased by the greatest number of teachers in both grades. In addition, a majority of teachers also increased the amount of time students spend explaining their thinking to other students and representing concepts or ideas in tables, graphs, or pictures.

Opinions and actions concerning WASL scores. Mathematics teachers held mixed opinions about the appropriateness of WASL and about the factors that affected WASL scores. Only about one quarter of fourth-grade teachers and about one third of seventh-grade mathematics teachers believed that the WASL tests were of the appropriate difficulty for the tested grade levels (see Table 29). Furthermore, most teachers agreed that changes in WASL scores could be attributed to factors that were unrelated to the standards. Three quarters of the teachers believed that better

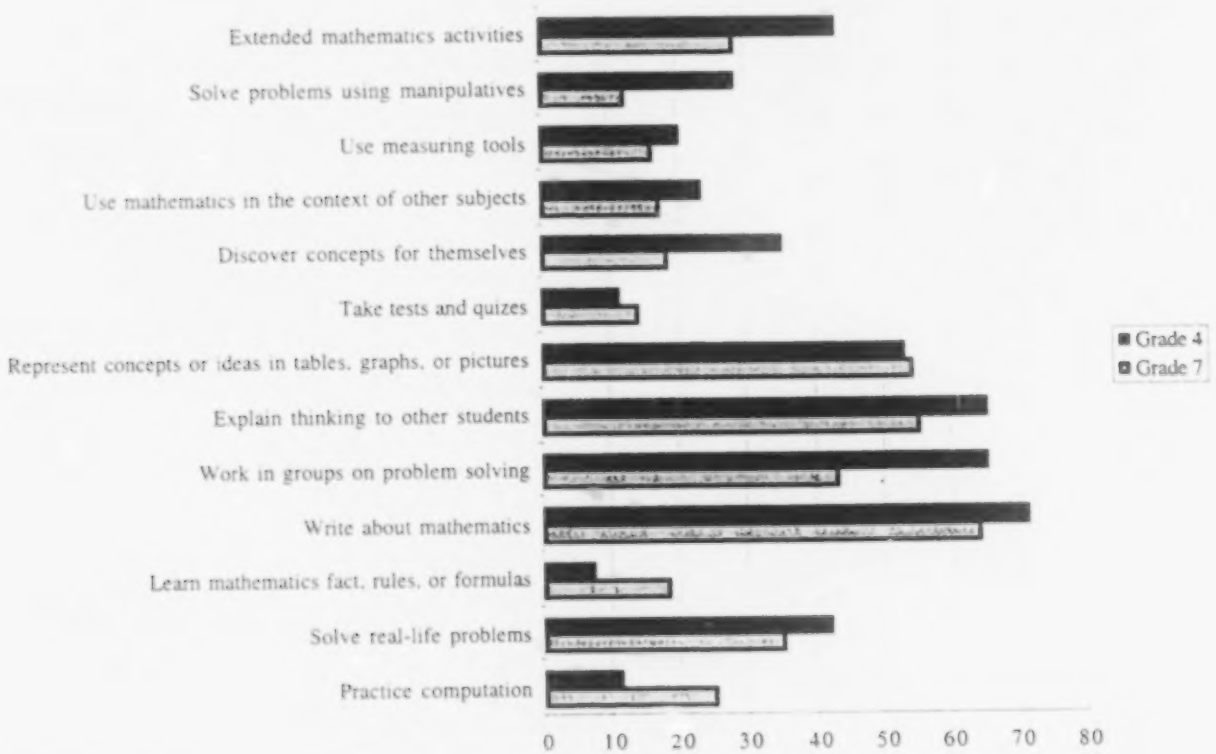

Figure 19. Increase in selected student learning activities in mathematics (percent of teachers indicating an increase).

Table 29

Opinions About WASL Scores and Assessments (percent of respondents who somewhat agree or strongly agree)

Statement	Fourth-grade teachers	Seventh-grade writing teachers	Seventh-grade mathematics teachers
Differences in student characteristics from year to year make it difficult to prepare students for WASL	73	71	74
Better test preparation is responsible for most WASL score gains	74	80	85
Better classroom-based assessments will lead to improved WASL scores	69	83	80
There has been little focus on classroom based assessments because scores from these assessments are not reported	45	66	59
The WASL tests permit sufficient accommodations for students with disabilities and Limited English Proficient students	27	42	26
The WASL tests are of appropriate difficulty for the tested grade levels	25	62	37
It is easy to raise student WASL scores by focusing on a few specific skills	21	47	30

test preparation was responsible for most of the changes in WASL scores. They also reported that differences between successive cohorts of students were an obstacle to preparing students for WASL. However, less than one third of fourth-grade teachers and seventh-grade mathematics teachers believed that it was easy to raise test scores by focusing narrowly on a few specific skills featured on the test.

Seventh-grade writing teachers present an interesting contrast. They were more likely to think that the WASL was of an appropriate difficulty, and they were more likely to say that scores could be raised by focusing on a few specific skills. These differences may be explained by the different nature of the writing assessment, which consisted of an extended writing task rather than a series of shorter questions.

Teachers agreed about the potential of classroom-based assessments (CBA) to improve scores, but indicated that CBA received less emphasis because the scores were not part of the assessment system. More than two thirds of the teachers thought that better classroom-based assessments would lead to improved WASL scores. However, more than one half reported that they focused on CBA less because the scores were not reported. In addition, fewer than one half of teachers believed

that the WASL tests permit sufficient accommodations for special needs students (students with disabilities and Limited English Proficient students).

Teachers have taken many steps to help students perform well on the WASL tests. Writing teachers indicated more frequent use of strategies that focused broadly on student writing than strategies that focused narrowly on the tests (see Table 30). In preparing students for the WASL test in writing, more than half of teachers used two activities: Six Trait or other rubric-based approaches to writing and open-ended questions in classroom work. Most fourth-grade teachers and almost one half of the seventh-grade teachers adopted a rubric-based approach to teaching writing at least once a week. Three quarters of seventh-grade teachers and over one half of fourth-grade teachers incorporated short-answer questions into classroom work once a week or more often.

Although WASL-specific practice was not as common in writing, there was quite a bit of it in evidence. About two thirds of teachers in fourth grade engaged in narrower practice activities at least once a month. These activities included practice with released items (60%), discussion of responses to WASL items (63%), practice using the rubrics to score classroom work (63%), and displaying the scoring rubrics in the classroom (64%). About 20% fewer seventh-grade teachers practiced with released items or discussed responses to WASL items once a month or more.

Teachers were given an opportunity to describe other strategies they used to prepare students for WASL in writing. They reported a wide range of activities, including some that were designed to foster writing broadly and others that

Table 30

Frequency of Activities to Help Students Do Well on WASL Test in Writing (percent of teachers using activity weekly or daily)

Activity	Grade 4	Grade 7
Teach Six Trait or other rubric-based approach to writing	64	48
Use open-ended questions (short-answer and extended-response) in classroom work	59	77
Display scoring rubrics in classroom	39	42
Discuss responses to WASL or WASL-like items that demonstrate different levels of performance	29	30
Have students practice using items released from WASL	29	14
Have students score classroom work using rubrics	27	22
Use materials from assessment Tool Kits	24	9

appeared to be narrowly focused on the test itself and others. Narrow reactions included:

> "Spent far too much class time teaching to the test instead of teaching."
>
> "Pray, teach test-taking, teach 'you must' revise and rewrite."

Teachers' responses that appeared to reflect the reform's intent included:

> "I have incorporated writing in all subject areas because of WASL."
>
> "Given them time to talk about writing with each other and with older students."

Most teachers' comments fell between these extremes. It is difficult to say, in isolation, whether the following comments represent appropriate or inappropriate reactions:

> "The district prepares a task of the month for both reading and writing . . . my classes complete one per month in each area."
>
> "I have recently incorporated WASL-like assessment in nearly every unit I teach throughout the year. These assessments include rubrics which imitate the WASL very closely."
>
> "I've created user-friendly WASL writing rubrics, and as we write for other subjects we use the rubrics in small groups to assess our progress."

Mathematics teachers also initiated a number of activities to promote WASL scores. Of the types of mathematics test preparation that we asked about, only one was used frequently by a majority of teachers (see Table 31). One half of fourth-grade teachers and slightly more than one half of seventh-grade teachers reported frequently using open-response questions in classroom work to help students prepare for WASL. The state-developed assessment Tool Kits designed to facilitate better classroom-based assessment were used less frequently, especially by seventh-grade teachers, despite many teachers' belief that better classroom-based assessment would lead to increased WASL scores.

More direct test preparation, such as having students practice WASL released items and discussing responses to WASL or WASL-like items, was less common but still occurred at least weekly in 48% of fourth-grade classrooms and 28% of seventh-

Table 31

Frequency of Activities to Help Students Do Well on WASL Test in Mathematics (percent of teachers using activity weekly or daily)

Activity	Grade 4	Grade 7
Use open-ended questions (short-answer and extended-response) in classroom work	62	50
Discuss responses to WASL or WASL-like items that illustrate different levels of performance	48	28
Have students practice using items released from WASL	42	34
Use material from assessment Tool Kits	36	13
Display scoring rubrics in classroom	35	15
Have students score classroom work using rubrics	27	16

grade classrooms. About 25% of teachers never used Tool Kits or rubrics (displaying or using rubrics) in their mathematics instruction.

In response to an open-ended question asking mathematics teachers about test preparation activities, teachers indicated that they prepare students for WASL using a range of strategies. Some strategies reflected the intent of the reform, leading toward a "deeper study of important mathematics" (Office of the Superintendent of Public Instruction, 2000, February 15). Some of these strategies were narrow, focusing on increasing test scores without developing students' knowledge and skill of mathematics. Other strategies fell in the continuum between deeper understanding of mathematics and inappropriate test practice that artificially inflates scores. Narrow reactions included:

> "Take aspirin, attend workshops, correlate EALRs, try to minimize any damage of preparing for WASL test in lieu of teaching math. Try not to neglect other subjects."
>
> "Practice daily in warm ups at the beginning of class as well as once a week, we have 1 hour of WASL sample questions for students to practice short and extended response and multiple choice."
>
> "Explaining answers and processes to students, practicing with students to watch for and avoid tricks and traps. Teaching that in the real world in math, correct answers are always the principal objective only in the state test it is not."

Some teachers reported using strategies that reflected the intent of the reforms:

"Increase students' math vocabulary in order to discuss in words or speech their solutions to given problems."

"More group work, extended application activities and more written explanations of their thinking or approach."

"Increased use of manipulatives; am learning to use new materials purchased by school district to teach mathematics; less reliance on textbook. More emphasis on writing and problem solving."

Strategies that fell between these extremes of appropriateness included:

"I have truly stressed basic skills. When these are not in place (and they often are not), it is impossible to do well on the higher level thinking skills."

"Weekly story problems graded on a rubric."

"Keeping math journals with vocabulary words giving biweekly quizzes that require written responses. Started a problem solving class."

"I use 4th grade Saxon math program four days a week. One day a week is devoted to problem solving using WASL sample questions and other sources that require more in-depth response. We compare results and how they would be scored on the WASL."

The question of appropriate test preparation activities is one that deserves continued study as the reform continues to be implemented.

Results: The Effect of School and Classroom Features on WASL Scores

There were a small number of significant relationships between WASL scores and the school and classroom features addressed on the principal and teacher surveys. Table 32 summarizes the results from four regression analyses (one for each subject); the detailed results are contained in Table C.3 in Appendix C. The strongest effects were related to the alignment of curriculum with the EALRs and to teachers' understanding of the reform. For two of the four subjects, WASL scores were higher in schools where there was greater alignment between curriculum and the EALRs (as reported by teachers). Scores were also higher in schools where teachers reported that they understood the EALRs and WASL well (this difference was significant for

Table 32

Summary of Regression Analyses (significant positive and negative effects)

School and classroom features	Reading	Mathematics	Writing	Listening
Principal reports				
SLIG resources				
Presence of District Standards				
Degree of Curriculum Alignment				
School Activities to Improve WASL				
Teacher reports				
Teaching Experience			+	
Test Preparation in Math	+			
Test Preparation in Writing				
Understanding of EALRs and WASL		+		
Degree of Curriculum Alignment	++	++		−−
Professional Development on WASL				
Professional Development on Education reform	−			

$+ p < 0.05$. $++ p < 0.01$. $- p < 0.05$. $-- p < 0.01$.

mathematics and on the borderline of being significant for reading). Teaching experience was a significant predictor of scores in writing.

Most variables we investigated had no significant relationship with WASL scores. This included the principals' reports of school-level actions taken to support the education reform. It also included teacher reports concerning test preparation and professional development related to WASL. There were also some counter-intuitive results in reading that are difficult to explain. There was a weak negative relationship between reading scores and WASL-focused professional development (a negative relationship between listening scores and curriculum alignment), and there was positive relationship between reading scores and test preparation activities in mathematics. Such unusual results are not uncommon in regression analyses that include many variables that are correlated as these were.

Discussion

This study paints a picture of schools in transition, responding to a state reform effort that is both incremental and evolving. The reform is incremental in the sense that the statewide testing program is being implemented gradually according to a

decade-long timetable.[8] It is evolving in the sense that elements are changing in unpredictable ways. For example, the nature of state support for professional development has changed annually for the past three years.[9] Similarly, the accountability system, which will be a cornerstone of the reform, is still being designed by a statewide commission. Also, the grades tested by standardized norm-referenced tests have been fluctuating. The survey results from principals and teachers are consistent with such a transitional reform setting.

Status of Implementation

The Washington education reform resembles standards-based reforms in other states in a number of key respects. It was initiated at the state level, it is organized around a set of academic standards adopted at the state level, and success will be measured by scores on a statewide test based on the standards. Like other states, the reform focuses on districts and schools as the unit of accountability rather than teachers or students (Elmore, Abelmann, & Fuhrman, 1996). Local educators are responsible for developing practices to help students master the standards. Under these circumstances we would expect a pattern of implementation that flows "downwards" from the state to the districts, from the district to the schools, and then to classrooms. Responses to our survey are quite consistent with this scenario.

Although test results are reported at the school level, making schools the formal unit of accountability in the Washington education reform, districts play an important role. Not only is there a tradition of strong district control in the state, but policies established at the district level are germane to the success of the reform. Districts are responsible for standards, curriculum, assessments, promotion/retention rules, report cards, and other policies that send messages to principals and teachers about priorities. Research shows that when district and state policies conflict, teachers receive multiple messages that may reduce their effectiveness (Smith & O'Day, 1991).

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[8] Administration of the WASL tests began with elementary-level tests in reading, writing, listening and mathematics, which were available on a voluntary basis in 1996-97. Over ten years, tests in these subjects, as well as social studies, science, arts, and health/fitness, will be introduced in elementary, middle and high school. The final WASL tests to be phased in are the elementary-level WASL tests in arts and health and fitness, which will be mandatory in 2006-07 (see Table 3).

[9] The state has become more prescriptive about schools' use of state funds allocated for professional development. In 1998-99, the state permitted schools to use funds for any professional development related to reform. In 1999-2000, the state required districts to use funds for three professional development days. See page 9 for further discussion of professional development.

It appears that districts have been quick to make their policies consistent with the state reform. In particular, most principals indicated that their districts have either developed or revised their academic standards since the EALRs and WASL were introduced. Also, most reported that district standards were aligned with EALRs in the WASL-tested subjects (reading, mathematics, writing, and listening). Somewhat fewer principals, though still a majority, said that their district standards were aligned with EALRs in the non-tested subjects (social studies, science, art, and health and fitness). Districts have also changed their assessment requirements in light of the reform, and principals believed their district tests were aligned with the WASL.

Rapid changes have been made at the school level, as well. During the past two years principals and teachers devoted considerable effort to learning about the reform and adapting school practices to support it. Both principals and teachers participated in professional development activities during the past two years, and roughly one half of the professional development they received emphasized elements of the reform. In addition, many principals and teachers served on school leadership teams responsible for implementing changes consistent with the reform. Perhaps as a result, both principals and teachers believed they understood the components of the reform well. Moreover, both groups were generally supportive of the goals of the reform. In particular, they thought the goals for students ("Students will think analytically, logically and creatively . . .") were attainable and the standards were appropriate for the benchmark grade levels.

In addition to raising awareness, most schools have taken steps to align their local curriculum and instruction with the EALRs. Principals and teachers believe that the curriculum was well aligned in the subjects of reading, writing, and mathematics, the subjects tested by WASL. Alignment was proceeding more slowly in the non-tested subjects. Some schools have gone further and changed policies regarding scheduling, grading and student retention. A number of schools increased time for reading, writing, and/or mathematics. Almost one half of the elementary schools changed their report card format. Additionally, almost one half of middle schools and a smaller number of elementary schools instituted student grade-level retention or promotion policies. These are more fundamental changes to the organizational and incentive structure in schools.

Fourth-grade teachers and seventh-grade mathematics and writing teachers changed curriculum content and instructional strategies to promote the goals of the

reform. In writing, teachers increased their coverage of genres, style appropriate to audience and purpose, development of concept and design and variety of forms. Many writing teachers changed their teaching strategies as well, using rubric-based approaches to writing, and commenting on student writing in different areas. In mathematics, the greatest change was an increase in coverage of probability and statistics. Mathematics teachers also increased their attention to drawing conclusions and verifying results, investigating situations, and organizing and interpreting information. Since the reform, more mathematics teachers are asking open-response questions with many right answers, having students explain their thinking to other students, and having students write about mathematics.

Some of these changes were in response to the EALRs and some appear to be direct responses to the format and content of the WASL test. For example, mathematics teachers indicated that the WASL extended-response and short-answer questions were very influential, and attention to WASL may explain their increased emphasis on writing about mathematics and asking open-response questions with many right answers. In writing, teachers' increased attention to audience and purpose, expanded time for commenting on student writing, and their use of a rubric-based approach to teaching writing may also be a result of the testing program.

However, the aforementioned changes were not large in magnitude. In most cases, teachers were using these reform-oriented strategies "one or two times per month" when they previously used them much less often. The bulk of their curriculum and instruction appeared to be much as it was two years ago. Writing instruction still focuses primarily on conventions and the writing process. Mathematics instruction still emphasizes number sense.

There were some notable differences between the responses of principals and teachers. Principals were more optimistic about the status of implementation than were teachers. For example, principals were more positive about the appropriateness of the EALRs and the WASL, as well as the attainability of the overall goals of the reform (see Figure 20). By 10 to 20 percentage points, more principals reported that curriculum in their schools was aligned with the EALRs and that each of the components of reform promoted better instruction and increased student learning. There are a number of possible explanations for these differences of opinion. They may reflect the fact that the reform is being implemented in a top-down manner and that principals are coming to understand and endorse it first.

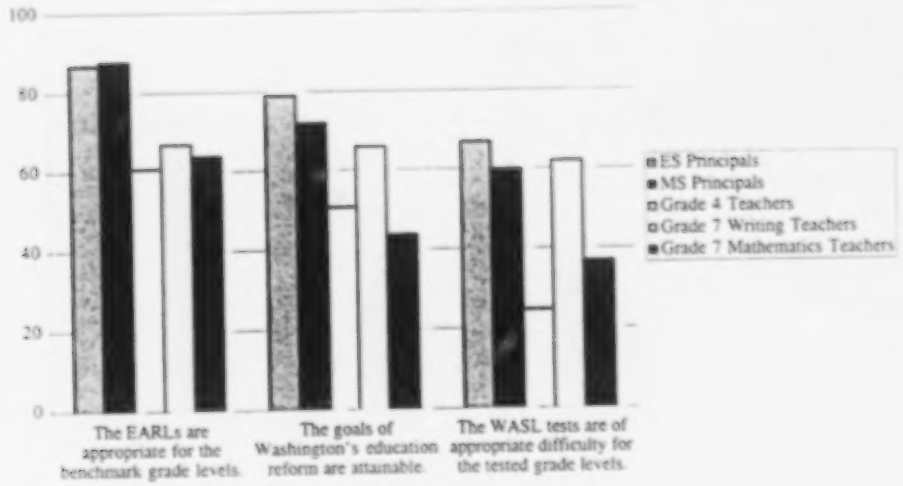

Figure 20. Attitudes toward reform goals (percent of principals and teachers who strongly agree or moderately agree).

They may reflect the reluctance of teachers to change and the resilience of classroom practices (see, for example, Cohen, 1990). Or they may reflect teachers' clearer understanding of the demands of the reform at the classroom level.

Survey responses also show differences in implementation among the components of the reform. In particular, teachers were attending to the WASL and EALRs more than the other aspects of reform. Most educators understood the EALRs and WASL, and most believed that these elements of reform promoted better teaching and learning. On the other hand, classroom-based assessment, in particular, was not as well understood and was not as widely implemented. This may be due, in part, to the fact that scores from classroom-based assessment were not used for public accountability. Principals also reported that they felt less pressure for their students to do well on the classroom-based assessment than on WASL or ITBS.

Classroom-based assessment was intended to play an important role in the reform, but it appears to be the most underdeveloped component. Classroom-based assessment is designed to help teachers understand the EALRs, provide coverage of EALRs not included in the WASL, and adapt assessment to students' needs (Ensign, 1998). However, few teachers received professional development in classroom-based assessment, and few teachers understood it well. The Commission on Student Learning developed Assessment Tool Kits to support classroom-based assessment.

Although principals encouraged teachers to obtain Tool Kit training, few have participated, and only a handful of teachers used the Tool Kit materials in preparing students for the WASL. Attitudes toward classroom-based assessment were somewhat paradoxical. Teachers believed that better classroom-based assessment would lead to improved student WASL performance, and many teachers participated on local committees to develop classroom-based assessments. However, this component of the reform was not widely implemented.

Interestingly, writing teachers seemed to be having an easier time implementing the reform than mathematics teachers. More writing teachers than mathematics teachers believed that the reform led to better teaching and learning, that the WASL tests were of the appropriate difficulty, and that the goals of the reform were attainable. More writing teachers than mathematics teachers found their professional development on WASL in their subject area to be excellent. Middle school writing teachers also viewed their curriculum as more aligned with the EALRs than did middle school mathematics teachers. In addition, writing teachers were more likely to report that the education reform supported the changes they were already in the process of making. Writing teachers also used WASL practice items more frequently than mathematics teachers. Mathematics teachers, in contrast, were finding the reform more challenging. One half of the seventh-grade mathematics teachers agreed that aligning curriculum with EALRs was difficult.

A few grade-level differences were detected, most notably that fewer fourth-grade teachers than seventh-grade teaches found the WASL to be appropriate for students in their grade level. Elementary principals and teachers were more supportive of classroom-based assessment than middle school educators. In writing, more seventh-grade teachers than fourth-grade teachers have changed their writing curriculum and teaching strategies in the last two years. In mathematics, just the opposite was true. More fourth-grade teachers than seventh-grade teachers made changes in their math curriculum and pedagogy in the last two years.

Relationships With WASL Scores

The WASL tests were designed to measure students' mastery of the EALRs, and WASL scores should be influenced by the actions districts and schools took to implement the education reform. We found significant positive relationships between WASL scores and curriculum alignment (reported by teachers) in three of the four subjects. Schools in which teachers believed their classroom curriculum was

well aligned with the EALRs had higher scores, other things being equal, than schools where teachers did not report strong alignment. This result indicates that "alignment" is more than just a catch-phrase; it is an important element in responding to the Washington reform. Higher reading scores were also found for schools where more teachers reported a firm understanding of the EALRs and WASL. This suggests a way that professional development can play an important role in preparing teachers to implement the reform.

Some people may be disappointed that so many of the other variables we tested were not positively related to WASL scores. Instead, we find these results to be quite heartening. There are three reasons for our optimism. First, it is quite unusual to find any relationships between aggregated survey measures of practice and aggregated test scores at the school level. Our previous research in Kentucky failed to detect any relationships between survey responses and KIRIS scores or KIRIS gains (Koretz, Barron, Mitchell, & Stecher, 1996; Stecher et al., 1998). The Washington analyses compared average responses from teachers to average scores of students, and the survey sample did not contain all teachers in all schools. Under these conditions, few significant differences are likely to be found. Second, the small sample size gave us limited power to detect differences, and pooling data from elementary and middle schools may have further clouded some associations. Finally, the fact that we did not find significant effects for certain variables is not conclusive evidence that they were unimportant. It might be the case that their direct impact on WASL was not strong enough to be detected under the conditions of this study, but they may still have great practical importance.

High-Stakes Assessment

The high stakes associated with performance on the WASL led to other changes in practice that may be cause for concern. Principals reported that they felt a great deal of pressure for their students to do well on the WASL, although the formal accountability system is still under development. The same pressure that leads to the positive changes such as those reported above also leads to potentially deleterious behaviors. Responses to the survey suggested that teachers were focusing on the WASL test more than the EALR, were shifting instructional time away from non-tested subjects, and were engaged in test preparation activities that may reduce the validity of WASL scores.

It appears that changes in classroom practice were focused more on the statewide test than the standards the test was supposed to reflect—that is, more on the WASL than the EALRs. While this distinction may seem minor to some, it is very important. Each WASL test samples only a fraction of the domain of performance described in the EALRs. Oftentimes it is the more complex, conceptual or integrated aspects of the domain that are omitted from the test because they are difficult to measure under controlled testing situations. Furthermore, each test requires students demonstrate performance in a limited number of ways. Thus a curriculum that was tailored to improve test performance might ignore many critical aspects of the adopted standards. That is why it would be wrong for the test to become the *de facto* standards. However, this substitution of test specifications and format for standards-based curriculum has been observed in other states with high-stakes test-based accountability systems. There is evidence that teachers narrow their focus to the tests and to the test scoring criteria rather than the domains the tests were designed to assess (Stecher, 1999a, 1999b; Stecher & Mitchell, 1995). There is some evidence that this is occurring in Washington, and care should be taken to monitor the situation.

Writing provides a specific example. Last year a task force convened by the state recommended a change to the WASL test in writing to eliminate uncertainty about which genre would be tested. Fourth grade was assigned narrative and expository writing, seventh grade was assigned persuasive writing and expository writing, and tenth grade was assigned persuasive and extended expository writing. The task force raised the concern about teachers' narrowing the writing curriculum to focus on these genres: "This action is in no way meant to limit classroom instruction or district and classroom-based assessments." This survey occurred before the change took effect, but our subsequent survey and case studies may be able to address whether the writing curriculum has narrowed since last year.

A more immediate concern is a reallocation of instructional time away from non-tested subjects. Washington adopted standards in eight subject areas, but the survey shows that the amount of time spent on the WASL-tested subjects has increased over the last two years. In many cases, schools have changed their schedules to increase time for reading, writing and mathematics. In other cases, fourth-grade teachers, who are responsible for all subjects and have some flexibility in allocating classroom time, have focused instruction on these subjects. They have

decreased the amount of time spent on science, listening, arts, and health and fitness.

This imbalance in subject matter emphasis may be alleviated as the state introduces WASL tests in science, social studies, arts, and health and fitness over the next four to seven years. However, the state plans to introduce these tests in grades other than the benchmark grades at the elementary and middle school levels (OSPI, 2000, March 27). Similar teacher surveys in Kentucky revealed that curriculum coverage varied significantly from one grade to the next in parallel with the subject matter emphasis of KIRIS (Barron & Stecher, 1999). For example, students in fourth and seventh grades received more instruction in reading, writing and science, while students in fifth and eighth grades received more instruction in mathematics, social studies, and arts/humanities. Splitting the WASL tests between two grades distributes the testing burden on a single grade level, and it also creates an incentive for teachers to focus their instruction on the tested subjects at the expense of non-tested subjects.

The emphasis on test scores had led to an increase in test preparation activities that may reduce the meaningfulness of the WASL results. For example, teachers were increasing their use of sample test items and WASL-like questions in class. By focusing narrowly on test preparation, rather than mastery of the standards, teachers may increase WASL scores without increasing students' broad knowledge of the EALRs. This is a complex issue, because some kinds of test familiarization activities are quite appropriate, while other types of focused preparation are quite inappropriate. There have been multiple instances recently of blatant cheating on statewide tests in other states. The strongest evidence that concern is appropriate in Washington is that both teachers and principals agreed that test preparation was responsible for most WASL score gains. Similar results have been seen in other states with high-stakes testing programs (Koretz, Barron, Mitchell, & Stecher, 1996). The A+ Commission, which is developing a formal accountability mechanism for Washington, would be wise to study the experience of other states carefully.

A final concern is the overall burden that testing places on students and teachers. The amount of state testing has increased with the implementation of WASL and the second-grade reading assessments, and it will continue to increase over the next seven years as more WASL tests become operational. Since the introduction of WASL, rather than eliminate extant local assessments, many districts have added or revised district tests. Thus, the overall time dedicated to test

administration, as well as test preparation, is increasing. Concerns about testing burden have caused state legislatures to intervene to alter the testing plans in other states (Chun & Goertz, 1998). Washington should be careful to keep testing demands manageable.

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Appendix A
Example of Essential Academic Learning Requirements in Mathematics

1. To meet this standard, the student will:

BENCHMARK 1 - GRADE 4	BENCHMARK 2 - GRADE 7	BENCHMARK 3 - GRADE 10
1.1		
number and numeration		
use objects, pictures, or symbols to demonstrate understanding of whole and fractional numbers, place value in whole numbers, and properties of the whole number system	use pictures and symbols to demonstrate understanding of fractions, decimals, percents, place value in non-negative decimals, and properties of the rational number system	understand and use properties and symbolic representations of real numbers
identify, compare, and order whole numbers and simple fractions	compare and order whole numbers, fractions, and decimals	explain the magnitude of numbers by comparing and ordering real numbers
	understand the concepts of prime and composite numbers, factors and multiples, and divisibility rules	understand concepts of and use processes involving prime and composite numbers, factors and multiples, and divisibility
	understand the concepts of ratio and direct proportion	understand and apply the concepts of ratio and both direct and indirect proportion
computation		
show understanding of whole number operations (+, -, ×, ÷) using blocks, sticks, beans, etc.	understand operations on rational numbers	understand operations on real numbers
add, subtract, multiply, and divide whole numbers	add, subtract, multiply, and divide non-negative fractions and decimals using rules for order of operation	compute with real numbers, powers, and roots
use mental arithmetic, pencil and paper, or calculator as appropriate to the task involving whole numbers	use mental arithmetic, pencil and paper, calculator, or computer as appropriate to the task involving rational numbers	use mental arithmetic, pencil and paper, calculator, or computer as appropriate to the task involving real numbers
estimation		
identify situations involving whole numbers in which estimation is useful	identify situations involving rational numbers in which estimation is sufficient and computation is not required	identify situations involving real numbers in which estimation is sufficient and computation is not required
use estimation to predict computation results and to determine the reasonableness of answers, *for example, estimating a grocery bill*	use estimation to predict computation results and to determine the reasonableness of answers involving rational numbers, *for example, estimating a tip*	use estimation to predict computation results and to determine the reasonableness of answers involving real numbers, *for example, estimating the interest on a loan*

Appendix B
Example of Essential Academic Learning Requirements in Writing

1. To meet this standard, the student will:

BENCHMARK 1 - GRADE 4	BENCHMARK 2 - GRADE 7	BENCHMARK 3 - GRADE 10
1.1		
represent one main idea or topic in text	demonstrate consistency in focus; construct a logical argument	maintain a sharp f cus throughout the work; focus text clearly to hold a reader's attention, to make a point, to tell a story, and/or describe a process or phenomenon
choose own topic; write in more than one genre	write in a number of genres and forms	approach a topic in an individualized and purposeful way
include relevant details	discriminate between essential, intriguing, or useful information and trivia	discriminate between essential, intriguing, or useful information and trivia
elaborate on details to enhance or support main ideas	demonstrate elaboration through examples, details, facts, and/or reasons, etc.	develop a topic, theme, or central metaphor with carefully chosen and focused detail and content
organize text with a clear beginning, middle, and end (spatial, sequential); use transitions to construct logical order	use effective organizational structures; construct sequenced paragraphs using effective transitions	control emphasis, sequencing, focus, and transitions in a variety of genres *such as poetry, technical, or narrative*
use paragraphs to organize text	write coherent paragraphs	write coherent paragraphs
	write analytically using basic and clear logic	develop analysis, synthesis, persuasion, and exposition logically; demonstrate advanced logic

Appendix C

Results of Regression Analyses of WASL Scores on Selected Survey Responses

Table C.1

Variable Means and Standard Deviations

Variable	Description	Mean	*SD*
Percent Free/Reduced Price Lunch	Percent of students receiving free or reduced price lunch	37.83	22.50
Percent Asian	Percent Asian students	5.70	7.09
Percent American Indian	Percent American Indian students	3.85	6.76
Percent Black	Percent Black students	3.98	6.73
Percent Hispanic	Percent Hispanic students	10.92	17.98
Percent White	Percent White students	75.54	22.32
Percent Female	Percent Female students	48.19	2.14
Enrollment	Total school enrollment	486.26	203.92
Principal Survey			
SLIG Expenditures	Amount of SLIG money per pupil	25.05	13.73
District Standards and Alignment	Existence of district standards in the four WASL-tested subjects and alignment with EALRs in each subject	13.56	2.58
Curriculum Alignment	Degree of curriculum alignment in the four WASL-tested subjects	9.57	2.10
School Actions	Sum of 17 actions possibly taken in response to the WASL	10.98	2.39
Teacher Survey			
Teacher Experience	Total number of years of experience	15.74	7.98
Teacher Understanding of EALRs & WASL	Understanding of the EALRs and the WASL	6.33	0.94
Curriculum Alignment	Degree of curriculum alignment in the four WASL subjects	10.50	2.40
Professional Development (WASL)	Degree to which professional development activities focused on the WASL in the four tested subjects	8.76	2.26
Professional Development (WA Reform)	Number of hours of professional development that focused on Washington's education reform	31.56	26.71
Test Preparation in Math	Frequency of 6 WASL mathematics preparation activities	16.82	4.19
Test Preparation in Writing	Frequency of 7 WASL writing preparation activities	20.43	4.50
WASL Scores	School-level WASL scores for 4th and 7th graders, pooled		
Mathematics		370.90	21.55
Writing		363.15	19.13
Reading		397.02	8.99
Listening		425.87	21.71

Table C.2

Regression of WASL Scores on Student and School Factors, Statewide

Student and school factors	Math		Writing		Reading		Listening	
	β	Sig.	β	Sig.	β	Sig.	β	Sig.
Percent Free/Reduced Price Lunch	-.015	.000	-.020	.000	-.016	.000	-.018	.000
Percent Asian	.019	.000	.024	.000	.017	.000	-.003	.312
Percent American Indian	-.022	.000	-.022	.000	-.021	.000	-.011	.000
Percent Black	-.018	.000	-.013	.000	-.015	.000	-.020	.000
Percent Hispanic	-.012	.000	-.007	.000	-.013	.000	-.013	.000
Percent Female	.007	.377	.030	.000	.004	.642	.016	.036
Enrollment	-.0005	.000	.0003	.004	-.001	.000	.0003	.005
N	1401		1401		1401		1401	
R^2	.31		.44		.34		.41	

Table C.3

Regression of WASL Scores on Principal and Teacher Survey Responses

Variables	Math		Writing		Reading		Listening	
	β	Sig.	β	Sig.	β	Sig.	β	Sig.
Percent Free/Reduced Price Lunch	**-.022**	**.001**	**-.024**	**.000**	**-.025**	**.000**	**-.018**	**.007**
Percent Asian	-.007	.689	.007	.679	-.0003	.986	.004	.845
Percent American Indian	-.016	.251	-.023	.093	-.012	.335	-.009	.530
Percent Black	.001	.958	.001	.956	.008	.633	-.003	.894
Percent Hispanic	.005	.496	.005	.488	.006	.331	-.013	.072
Percent Female	.009	.818	.021	.592	.007	.850	.076	.077
Enrollment	-.0002	.656	.001	.215	-.0004	.334	-.0004	.487
Principal Survey								
Amount of SLIG money	-.005	.420	-.004	.491	.001	.927	.011	.124
Existence of District Standards	.020	.683	-.040	.417	.042	.359	-.002	.963
Curriculum Alignment	.033	.561	.056	.335	.018	.731	.034	.588
# of School Actions in Response to WASL	.041	.290	.025	.514	.049	.172	.006	.890
Teacher Survey								
Teacher Experience	.022	.062	**.023**	**.046**	.011	.287	-.003	.790
Test Preparation in Math	.047	.066	.049	.055	**.060**	**.011**	.001	.977
Test Preparation in Writing	-.025	.311	-.045	.074	-.010	.647	-.020	.469
Teacher Understanding of EALRs and WASL	**.279**	**.010**	.162	.130	.193	.051	-.143	.219
Curriculum Alignment	.138	**.000**	-.017	.650	**.169**	**.000**	**-.180**	**.000**
Professional Development (WASL)	-.016	.699	.005	.902	.007	.874	.062	.171
Professional Development (WA Reform)	-.005	.103	**-.006**	**.050**	**-.008**	**.010**	.002	.509
N	83		83		83		83	
R^2	.655		.564		.719		.600	

Appendix D

List of Principal and Teacher Survey Items Included in Regression Model

Variable	Principal Survey: Question wording	Scale
Per Pupil SLIG Expenditures	Did your school receive Student Learning Improvement Grants (SLIG/LIAs) for in-service training or formal professional development activities this school year? If yes, approximately how much SLIG/LIA money did your school spend this school year for in-service training or formal professional development activities?	Dollar amount divided by total enrollment
District Standards and Alignment	Currently, how well do your district's standards align with the EARLs in each subject (reading, writing, mathematics, communication)?	Do not have standards Poorly aligned Somewhat well aligned Very well aligned
Curriculum Alignment	In your school, how well does the current curriculum align with the EALRs in the benchmark grades (Grades 4 and 7; in reading, writing, mathematics, communication)?	Poorly aligned Somewhat well aligned Very well aligned
School Actions	Please indicate if your school has done each of the following in reaction to WASL: 1. held staff meetings that focus on WASL issues; 2. provided release time for teachers to prepare for WASL; 3. developed a school plan for improving performance on WASL; 4. implemented test preparation activities (e.g., example tests); 5. instituted schoolwide policies to address curriculum gaps (e.g., use of Weekly Reader, "task of the week"; 6. encouraged teachers to obtain assessment Tool Kit training; 7. directed Student Learning Improvement Grant (SLIG/LIA) funds towards WASL-related activities; 8. provided incentives for students related towards WASL performance (e.g., parties, fieldtrips); 9. appealed to teachers' and students' school pride to do well on WASL; 10. transferred teachers to different grades or subjects; 11. changed report card format; 12. implemented schedule changes that increased time for mathematics, reading, and/or writing; 13. had teachers or school leadership team take WASL test items; summer school, created Saturday school, etc.); 14. extended instructional hours (e.g., created all-day kindergarten, instituted 15 created homework clubs; 16. instituted a student grade-level retention or promotion policy; 17. held cross-grade meeting of teachers to discuss WASL test results.	1 no; 2 yes

Appendix D (continued)

Variable	Teacher Survey: Question wording	Scale
Teacher Experience	Including this year, how many years have you taught on a full-time basis: In any location (including other states)?	Number of years
Teacher Understanding of EALRs and WASL	How well do you understand each of the following aspects of Washington's education reform (Essential learnings and benchmarks (EALRs); Washington student assessment (WASL))?	Do not understand Understand somewhat Understand well Understand very well
Curriculum Alignment	How well is your current curriculum aligned with the EALRs in the following subjects (reading, writing, mathematics, communication)?	I do not teach this subject; Poorly aligned Somewhat well aligned Very well aligned
Professional Development (WASL)	During the past two years, how much of your in-service training or formal professional development focused on the following topics (WASL in reading; WASL in writing; WASL in mathematics; WASL in listening)?	None A small amount A moderate amount A great deal
Professional Development (WA Reform)	During the past two school years, approximately how many hours of in-service training or formal professional development did you participate in? Of these, how many were related to Washington's education reform?	Number of hours
Test Preparation in Math	How frequently do you engage in each of the following activities to help students do well on the WASL test in mathematics? 1. Have students practice using items released from WASL (e.g., Example test, Assessment sampler); 2. Discuss responses to WASL or WASL-like items that illustrate different levels of performance (e.g., NCS Mentor, Example test); 3. Use material from assessment Tool Kits; 4. Have students score classroom work using rubrics; 5. Use open-ended questions (short-answer and extended-response) in classroom work; 6. Display rubrics in classroom.	Never (zero times per year) 1-2 times per semester (about 1-5 times per year); 1-2 times per month (about 6-30 times per year); 1-2 times per week (about 31-80 times per year); Almost daily (more than 80 times per year)
Test Preparation in Writing	How frequently do you engage in each of the following activities to help students do well on the WASL test in writing? 1. Have students practice using items released from WASL (e.g., Example test, Assessment sampler); 2. Discuss responses to WASL or WASL-like items that illustrate different levels of performance (e.g., NCS Mentor, Example test); 3. Use material from assessment Tool Kits; 4. Have students score classroom work using rubrics; 5. Use open-ended questions (short-answer and extended-response) in classroom work; 6. Display rubrics in classroom; 7. Teach Six Trait or other rubric-based approach to writing.	Never (zero times per year) 1-2 times per semester (about 1-5 times per year); 1-2 times per month (about 6-30 times per year); 1-2 times per week (about 31-80 times per year); Almost daily (more than 80 times per year)

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